DUKANE

iPC™ v1.7

intelligent Process Control

Browser-based interface is used to set parameters and display part data, providing a complete graphical environment for communicating with the DPC IV or DPC IV Plus ultrasonic system.

Context-sensitive online help, electronic documentation and unlimited technical support.

iPC manages a library of up to 100 user-definable setups on the host computer.

Available COM port and a 9-pin RS-232 cable interface with the DPC IV. Full networking capability provides setup and part information from any DPC IV on your network.

Software Installation Guide

Dukane Part No. 403–545-02

Dukane Corporation • Ultrasonics Division • 2900 Dukane Drive • St. Charles, Illinois 60174 USA • TEL (630) 797-4900 • FAX (630) 797-4949

ISO 9001:2000 Dukane products are manufactured in ISO registered facilities

www.dukcorp.com/us

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2900 Dukane Drive
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Netscape Navigator is a trademark of Netscape Communications Corporation

*i*PC Revision History

Revision Number	Revision History	Date
–00	iPC v1.3 Original release	28–Sept–2001
–01	DPC v3.2 and v3.3 Firmware Information	01–Nov–2001
–02	iPC Version1.7 Update DPC IV v3.6 Firmware compatibility DPC IV Plus v4.2 Firmware compatibility Windows XP Screenshots and Instructions Security Key (Dongle) no longer required Serial Port Setup Now Automatic New features in Version 1.7 New features in Version 1.6 New features in Version 1.5 New features in Version 1.4 Appendix A added to describe the data file format, parameter codes and graph data reconstruction.	24–Feb–2005
Addendum 1	IE Configuration for Windows XP Service Pack 2	30–Mar–2005

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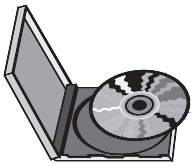

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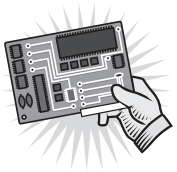

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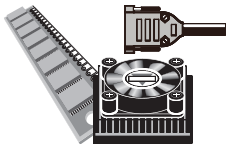

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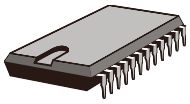

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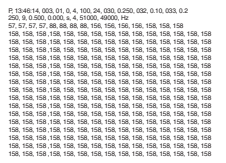

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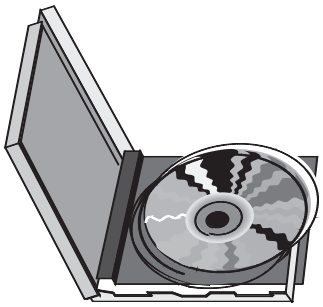
SECTION 1

Unpacking the *iPC*™

- *iPC* Package Contents
- What's New in v1.7?
- Installation Flowchart



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Package Contents

The iPC™ v1.7 software package (No. 437–00118) contains three items —

1. This Software Installation Guide (No. 403–545–02)
2. Serial Cable (No. 200–1126)
3. The iPC™ v1.7 CD-ROM (No. 437–00118) which contains:
   - iPC™ v1.7 Software Installer `(Setup.exe)`
   - What's new in v1.7? `(What new in v1.7x.doc)`
   - Installation Guide `(iPC Installation Guide.doc)`
   - Final Release Notes `(Final Release Notes for iPC1.7x.doc)`

These three items are pictured below.

What's New in v1.7?

v1.7 Enhancements From v1.6

The hardware security key which plugged into the parallel port is no longer required. Just enter the serial number from the CD into the user information window (see page 45) when requested.

***i*PC** can now detect if the Sun Micro Systems Java Virtual Machine is active. Although the JVM from Microsoft is based on the JVM from Sun, iPC is not compatible with Sun's JVM. Each time iPC starts, it scans the PC to see if the Sun Micro Systems JVM is active. If it is, the program will abort and provide an error message indicating that the Sun JVM must be disabled before continuing.

IMPORTANT –
By default, the iPC saves files to the directory where the iPC was installed. The default location for installation and saved files is **C:\iPC**

If you installed the iPC to another directory (e.g. C:\Program Files\iPC) then all files will be saved to that directory.

v1.6 Enhancements From v1.5

The Graph page has a new check box that allows the user to save part data and graph data for each weld cycle automatically to the computer hard drive. The feature is highlighted at the bottom of the sample page below. It is normally disabled, but checking the box will enable the feature.

When Save Graph Data + Parameters Automatically is enabled, iPC creates a csv–type text data file in the folder named `C:\iPC\Saved Data`. This folder should not be renamed or removed. The file is named `YYYYMMDD.csv` where YYYY represents the year, MM the month and DD the day. See Appendix A for a detailed description of the file format.

v1.5 Enhancements From v1.4

1. Within the **Save** pop up box for the Save Data and Save Graph Data features, the navigation process has been revised to remove the '.' and '..' respectively.
2. Within the Graph page, the Zoom feature has been revised to center the displayed graph after selecting zoom values.
3. Within the Graph page, the size of the graph area was optimized to produce a more accurate representation of the graph data.
4. Within the Graph page, the right hand graph navigation arrows have been revised to green to reflect that they are associated with the right hand graph data which is displayed in green.
5. Within the Process Setup page, the Afterburst feature has been revised to permit a minimum delay and duration value of zero.
6. Within the Process Setup page, the Scrub feature has been modified to comply with the DPC's maximum value of 1.270 seconds for scrub time.
7. Serial port parameters on the host computer are now automatically setup. The setup instruction in Section 5 – Serial Port Settings are not needed for v1.5, v1.6 or v1.7.

v1.4 Enhancements From v1.3

1. Setup file names, as well as Graph and Parts data file names can now be entered by the user. The file paths can also be chosen.
2. There are a new ZOOM and a SLIDER features in the Graph page.

Please note the following known issues for version v1.4x

- *The four user parameter fields, **JOB ID**, **HORN**, **BOOSTER**, and **FIXTURE** must be 10 characters or less, ending with **Enter** key, and can not contain commas. Any lower case letters will be converted to upper case.*
- *When the iPC is started, the **Operate** page will not display any part data that is stored in the DPC. The iPC only displays part data that is generated while it is running.*
- ***Date** cannot be set from the iPC. **Date Format** cannot be set from the DPC.*
- *Setup files created from off line cannot be used when on line, and verse true.*
- *Cannot make any change from iPC when DPC is in cycle. Cannot make any change from DPC when iPC is in a change process.*
- ***Part Sampling** does not work.*
- *If there is a printer attached to the DPC's parallel port it should be turned off during Group load.*
- *In the **Graph** page, the vertical Right Axis item 'none' has no equivalent in the DPC, consequently this value cannot be restored from a setup file.*

v1.3 Enhancements From v1.2

1. iPC now works on both local and networked remote DPCs.
2. Part data is saved as comma delimited (*.csv) files which can be opened by EXCEL. The file is saved to the directory where the iPC was installed.

   Implicit Saving: The iPC will automatically save the displayed part data on the Operate page when it reaches 20,000 cycles. The file is named partMMM.xml where MMM is a number starting at 301 and increasing by 1 each time the file is automatically saved.

Explicit Saving: The iPC will save the displayed part data on the Operate page when the Save Parts Data button is clicked. The file is named partNNN.xml where NNN is a number between 1 and 100 chosen from the selection box on the Operate page.

The iPC will clear the displayed part data in the Operate page, and begin to display the new cycle after saving.

3. iPC is now able to save DPC graphic data to a file. The data is saved as comma delimited (*.csv) files which can be opened by EXCEL and redrawn as a graph based upon the saved data. The file is saved to the directory where the iPC was installed. The file is named graphJJJ.xml where JJJ is a number between 1 and 100 chosen from the selection box on the Graph page.
4. You can now view parameters in real–time from the Operate page.
5. Printer setup now available on Utilities page. Go to the Utilities page, select DPC and choose the setup number. To print, select View Setup then click the OK button. This will preview the output on the screen. Then either select Print from the Internet Explorer File menu, or click the close box in the left–hand quadrant to return to the Utilities page.

V1.3 Limitations –

1. Code currently does not work properly under Windows ME.
2. Using the minimum supported computer (200MHz Pentium) results in extremely slow performance due to shortcomings in the processor architecture. See Section 6 for a timing example. A recommended setup is a 500MHz Pentium III.
3. The iPC only displays part data generated while the iPC is running. When the iPC is started, it does not display any part data that was previously stored in the DPC.
4. Part sampling does not work because the DPC currently does not support it.

V1.3 Restrictions –

1. The four user parameter fields JOB ID, HORN, BOOSTER and FIXTURE must be 10 characters or less. These can be any characters including spaces except a comma. All lower case letters are converted to upper case.
2. You cannot make any change from the iPC while DPC is in cycle. You cannot make any change from the DPC while iPC is in a change process.
3. In the Graph page, the right vertical axis item None has no equivalent in the DPC. As a result this value cannot be restored from a setup file.
4. If you have a printer attached to the DPC's parallel port, it should be turned off during Group load.

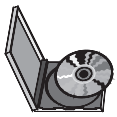
v1.2 Enhancements From v1.1

1. Able to load the DPC setup to the iPC from the Process Control page.
2. Select the DPC setup and view the setup Job ID from the Process Control page.
3. View the current DPC setup Job ID from the Operate page.
4. Select the primary weld method and parameters from the Operate page.

*i*PC v1.7 Installation Flowchart

Start

1. Unpack *iPC*™ v1.7

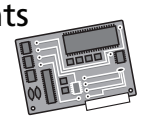


All Items Identified ?

NO → Contact Dukane Service Department if any items missing. Contact carrier if items damaged.

YES

2. DPC Requirements



DPC 4 or 4 Plus & Firmware Correct ?

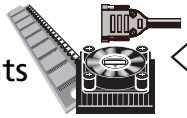
NO → Contact Dukane Service Department. v3.20 or earlier Firmware may require an internal hardware update.

YES

3. Setup DPC

Configure DPC–IV Settings

4. PC Requirements



PC Meets Requirements ?

NO → Upgrade Windows™ and/or download latest versions of IE. Java VM on CD

YES

5. Setup Computer

Configure Serial Port & Internet Explr

6. Connect DPC to Computer

Serial Cable and/or DPC 4 Network

7. Install *iPC*™

iPC Fresh Install ?

NO → v1.3 or Later ?

NO → v1.2 Upgrade ?

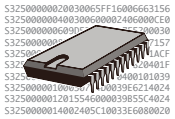
NO → v1.1 Upgrade → Transfer Setup Files to DPC, Then Uninstall iPC v1.1

YES → Uninstall v1.2 First

YES

YES

8. Firmware Update



DPC v3.60 or Later ?

NO → DPC v3.30 or Later ?

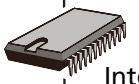
NO → v3.20 ?

NO → Call Dukane Service

YES

YES → Rewrite Flash Memory

YES → Internal Service Upgrade



9. Start *iPC*™

Launch *iPC* v1.7 Software

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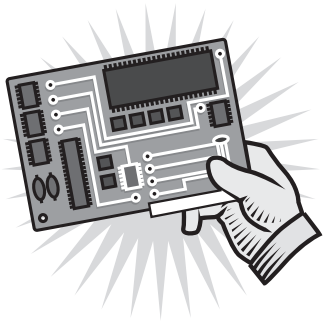
SECTION 2

DPC Requirements

- Model Number
- Firmware Revision



DPC Model Number 11
DPC Firmware Version 11

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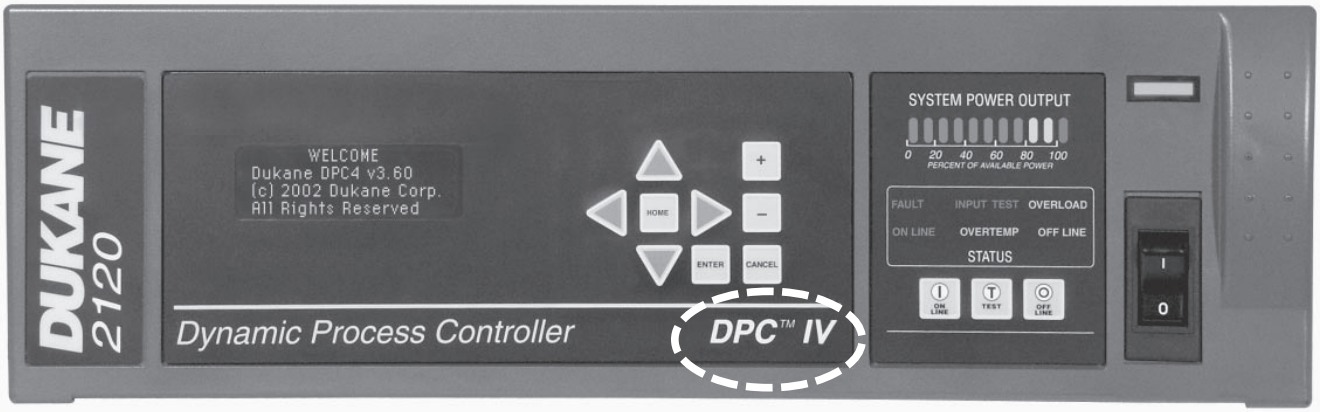
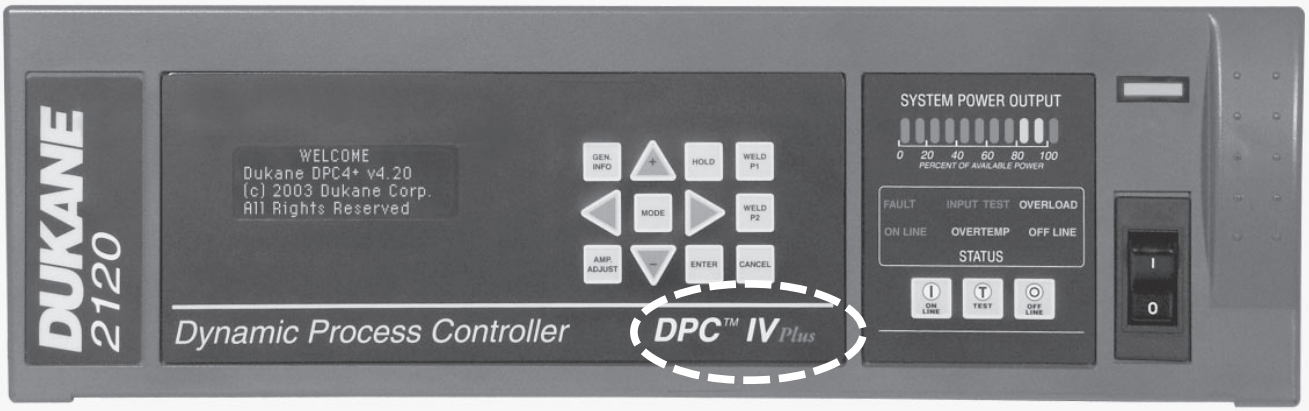
DPC Requirements

DPC Model Number

The iPC™ software is designed to control a Dukane DPC IV or DPC IV *Plus*. The DPC Level 3 and Level 2 are not capable of being controlled by iPC software. A DPC Level 4 can be easily verified from the front panel layout shown in the illustrations below. The DPC™ IV logo is prominently displayed under the menu keys.





DPC Firmware Version

The DPC firmware revision must be Version 3.60 or later. When the DPC is initially powered up, it executes a self test, then briefly displays the firmware revision number.

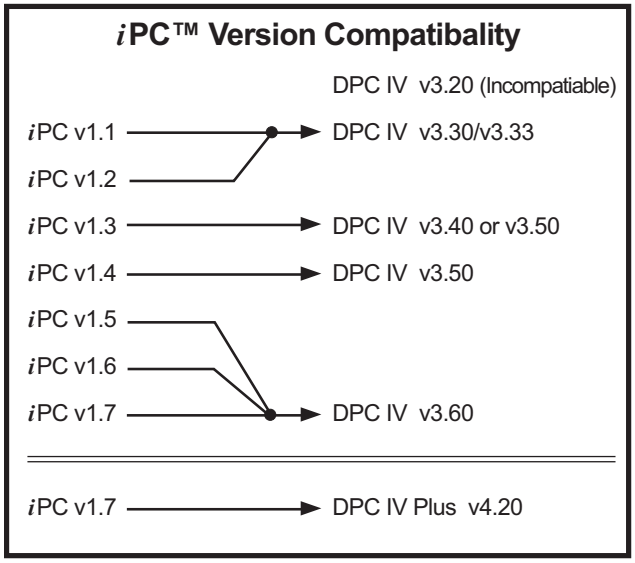
```
      WELCOME
Dukane DPC4 v3.60
(c) 2002 Dukane Corp.
All Rights Reserved.
```

CAUTION

Do not install iPC v1.7 until the DPC firmware has been verified as being version 3.60 or later.

If you have a DPC IV with v3.60 or a DPC IV Plus with v4.20, you may continue with preparations for the iPC™ v1.7 installation or upgrade. DPC IVs with v3.30, v3.33, v3.40 or v3.50 will need to upgrade the firmware. Instructions for rewriting the Flash Memory to bring the DPC firmware to v3.60 are covered later in the **v3.6 Firmware Update** section starting on page 63.

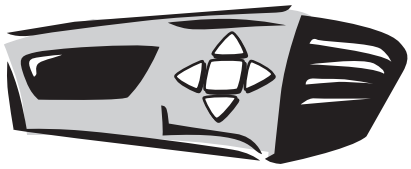
DPCs with versions 3.20 and earlier require a processor board exchange with a new PLD and Flash Memory. The service upgrade is handled through the Service Department (see Section 11 for contact information). Failure to upgrade the DPC internally and updating the DPC v3.20 firmware may result in a successful firmware update, but unpredictable operation or incorrect interpretation of the DPC weld parameters.



SECTION 3

DPC Setup

- DPC Serial Port
- DPC Node ID



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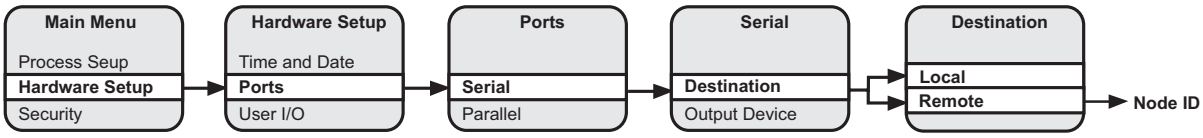
Serial Port

Three separate options for the serial port must be configured. All three are accessed from the front panel of the DPC IV or DPC IV Plus.

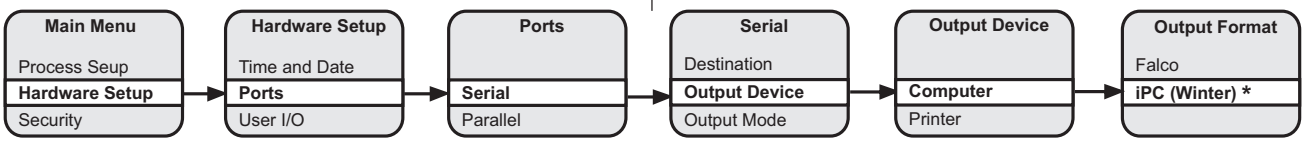
Local/Remote

If a single DPC is connected to the PC the configuration is **Local**. If a network of two or more DPCs are connected to the PC, then the DPC connected to the computer is set to **Local** and the remaining DPCs must be set to **Remote**. The remaining DPCs that are set to **Remote** must also identify the **Node ID** of the DPC connected to the PC. Refer to the section on **Naming Procedure** in the DPC IV manual.



Format

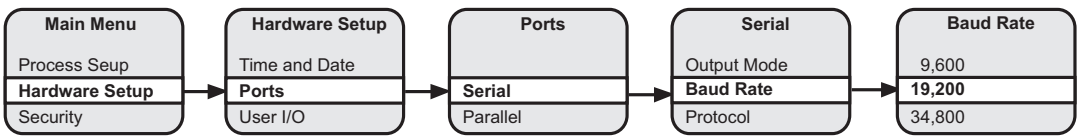
Next the serial port output device must be configured. Set this to **iPC** format.



> * Output Format —
> DPC firmware version 3.50 and later displays **iPC**.
> DPC firmware version 3.40 and earlier displays **Winter**.

Baud Rate

The final option to be set is the baud rate. This determines the communication speed between the DPC and the PC. Set the speed to **19,200** as indicated in the diagram below. The port access rate on the PC must match the DPC setting. We will set the PC serial port speed in Section 5.



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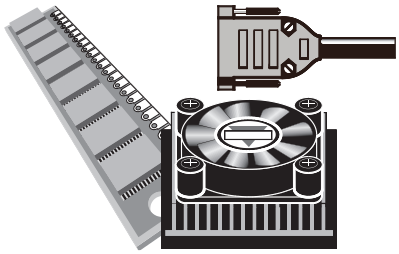
SECTION 4

PC Requirements

- Processor
- Memory
- Windows™
- Internet Explorer



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Computer Requirements

Version 1.7 of the iPC™ software requires the following minimum computer hardware configuration.

Processor

A IBM–compatiable PC or laptop with a Pentium class (or better) CPU is required. The processor must have a clock speed of at least 200 MHz to operate. A faster processor with a more advanced architecture will provide improved performance.

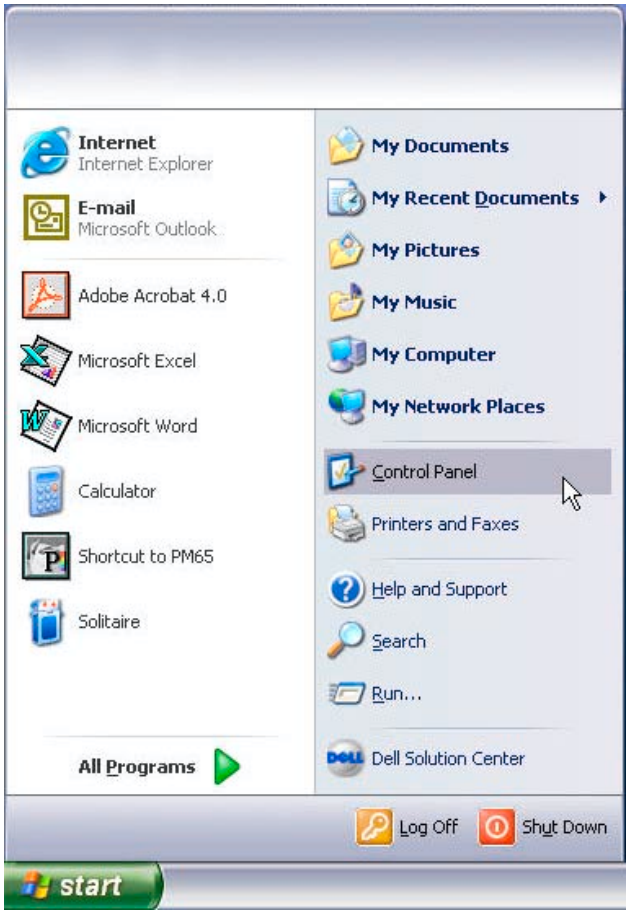
TIP –
The minimum requirements are not the same as the suggested configuration (500MHz Pentium III). Just as we have a MDR of vitamins and calories, no one tries to live on 600 calories per day.

Memory

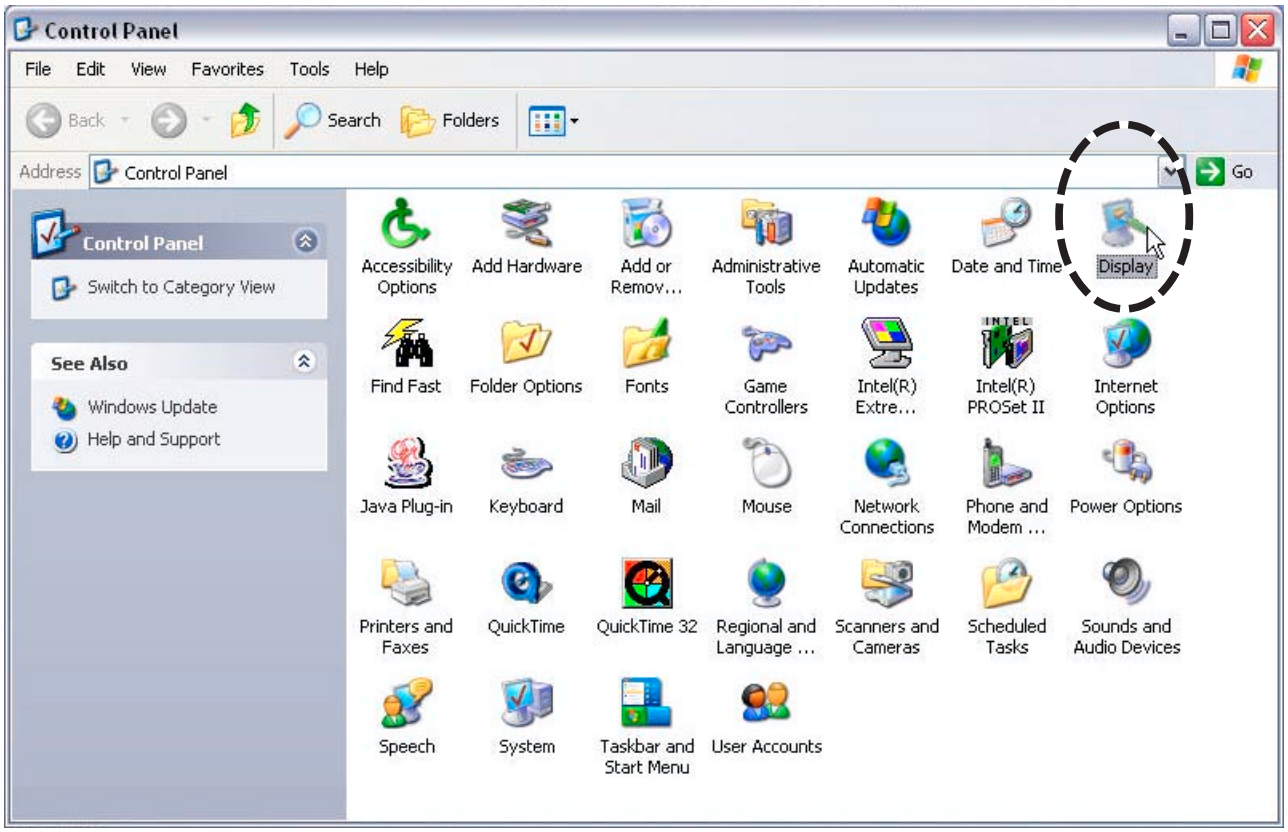
At least 32 MB of RAM are required. Less memory will result in an unacceptable performance penalty. 64 MB of memory or more will enhance the system response.

Video Display

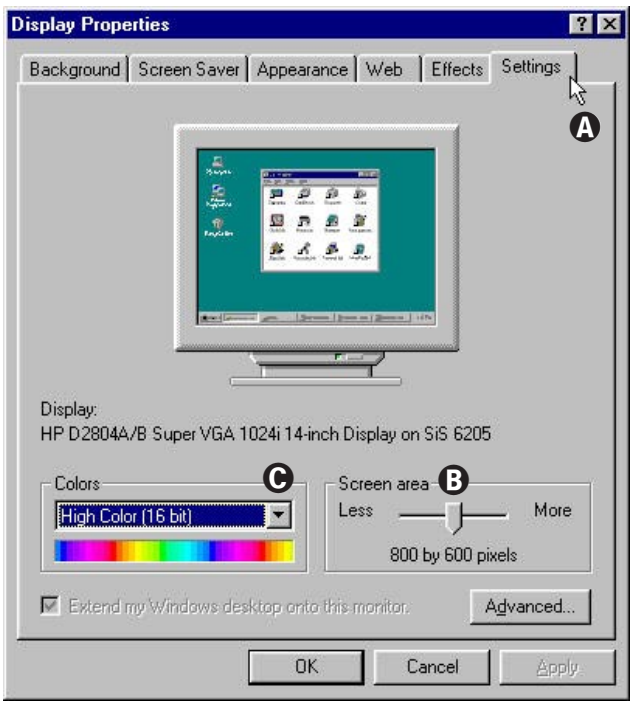
A color display with at least 800 x 600 resolution and 256 colors (8-bit) is required (SVGA). Higher resolution and/or more colors also work well. To determine your settings, click on the **Start** menu, then select **Control Panel** as shown.

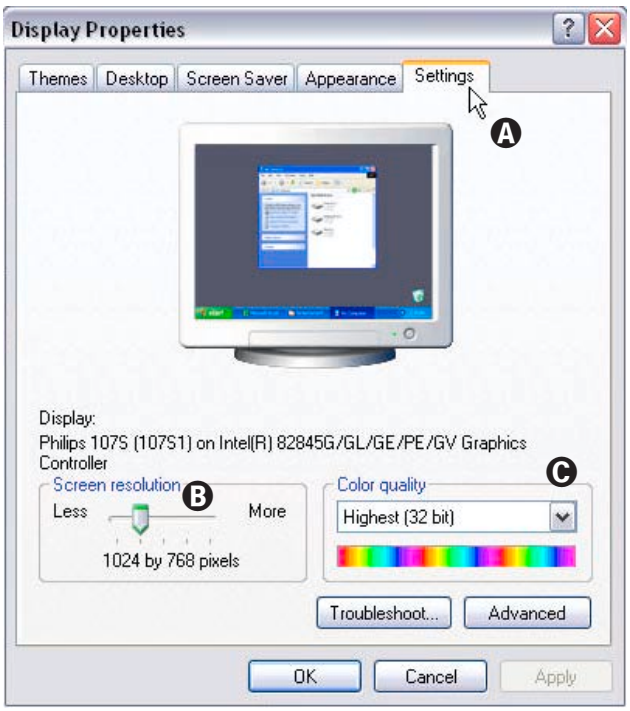


In the Control Panel window, double-click the **Display** icon.



A new popup window appears showing your current display properties. Click the **Settings** tab Ⓐ





to view your current settings. Use the slider in the lower left corner of the window Ⓑ to adjust the display to at least 800 x 600. The drop–down menu in the lower right Ⓒ indicates the current color palette. Select at least 256 colors (8–bit). Your system may be capable of higher resolution and/or more colors. You may increase these settings to your preference. When you are finished, click the **OK** button and then close the **Control Panel** window.

CD-ROM Drive

A CD-ROM drive is required to install the iPC™ software.

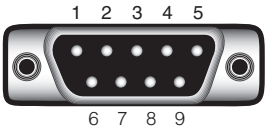
Hard Disk Space

The iPC software requires approximately 1.8MB of hard disk space for installation. If all the files from the CD (firmware updates, Java VM installer, etc.) are copied to the hard drive, then about 8.6 MB is required.

Communication Ports

Serial Port

A serial port is required for the PC to communicate with the DPC™. The serial port has a DB-9 connectors and is also referred to as a COM port in the iPC software. See the figure to the right for an iullustration of the serial communication port.



COM – a contraction of communications, and it is used to describe the serial port on a PC. COM is generally used in conjunction with a number, as in COM1, COM2, COM3, or COM4

Parallel Port

A parallel port is not required for the software. Earlier versions required a hardware security key to be installed on the parallel port. This has been eliminated in iPC v1.7.

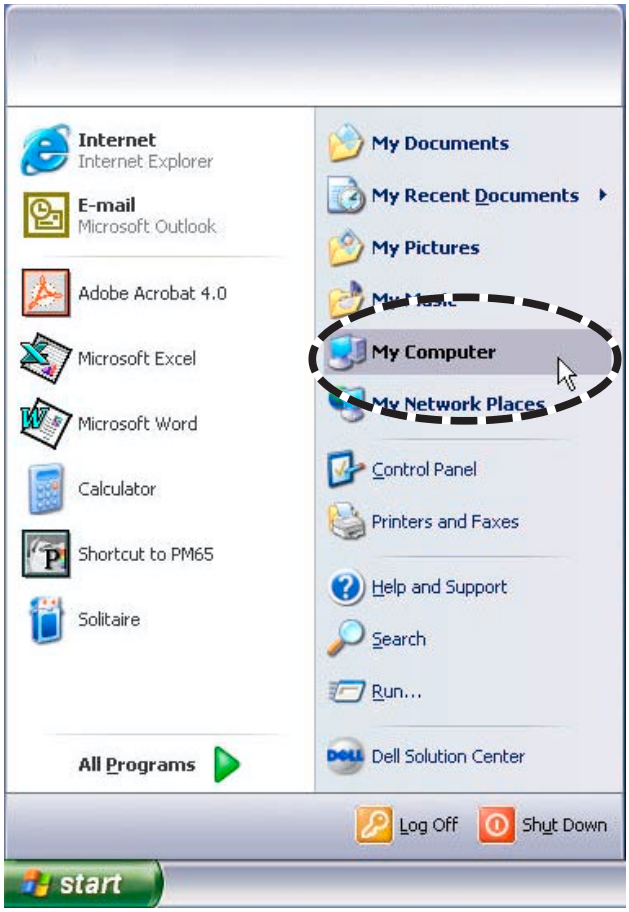
NOTE –
iPC no longer requires the use of a hardware security key for operation.

Software Requirements

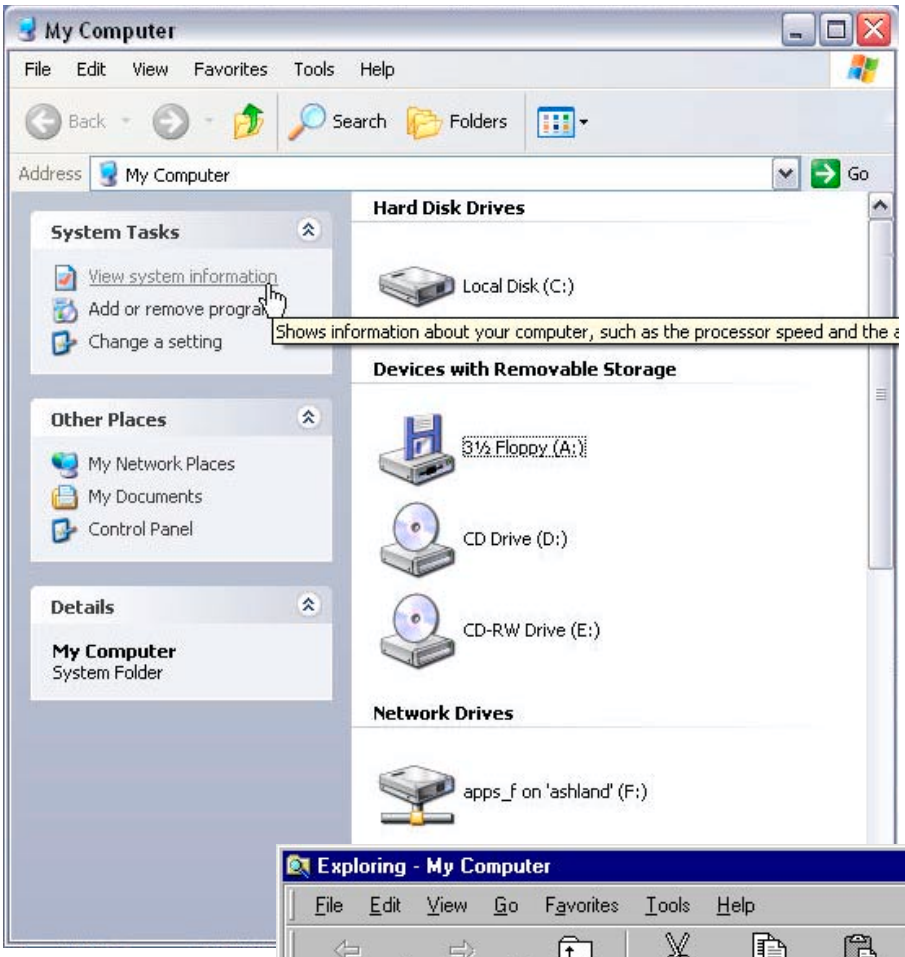
Version 1.7 of the iPC™ software requires **Windows™** and **Internet Explorer** to be installed.

Windows™

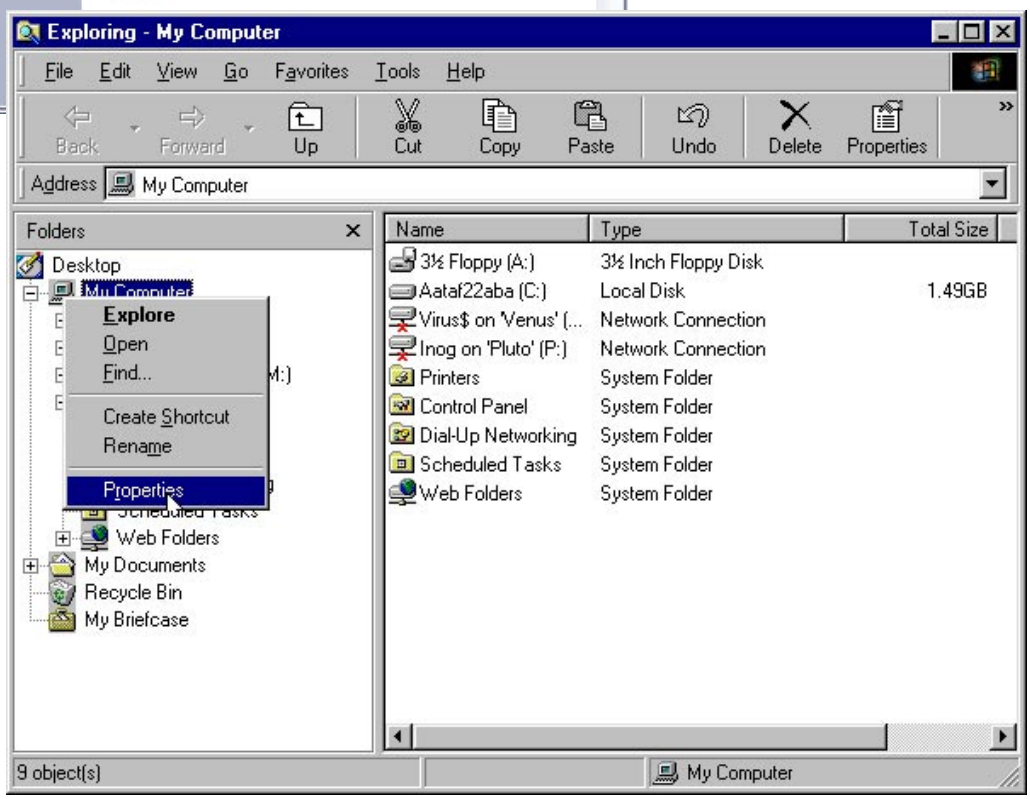
The computer operating system must be Windows 98, Windows ME, Windows 2000, Windows NT or Windows XP. The iPC v1.7 is not supported under Windows 95. To determine which version of Windows you have, select **My Computer** in the Windows **Start** menu as shown below.



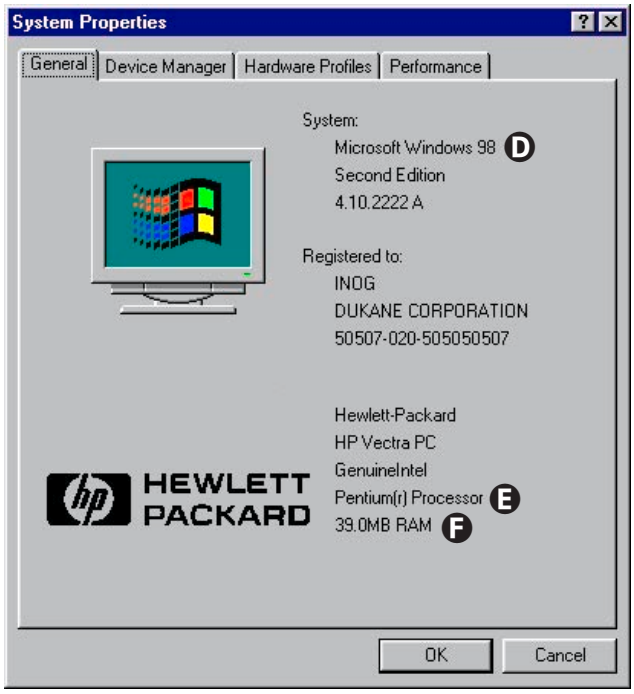
For Windows XP, select **View System Information** as shown in the screen shot directly below.



For earlier versions of Windows, open **Windows Explorer**, right click on **My Computer** in the screen and select **Properties**.

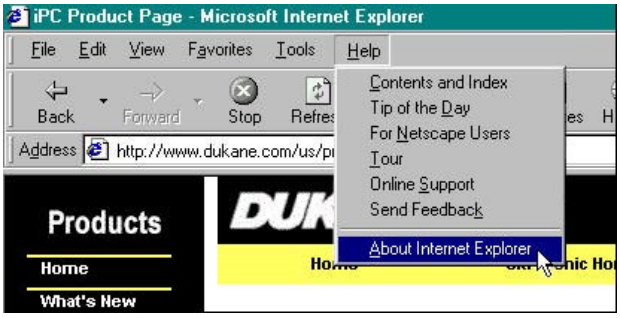


A new popup window will appear showing the version of Windows™ currently installed as shown Ⓓ. This window also shows the type of processor Ⓔ, and amount of memory Ⓕ installed.

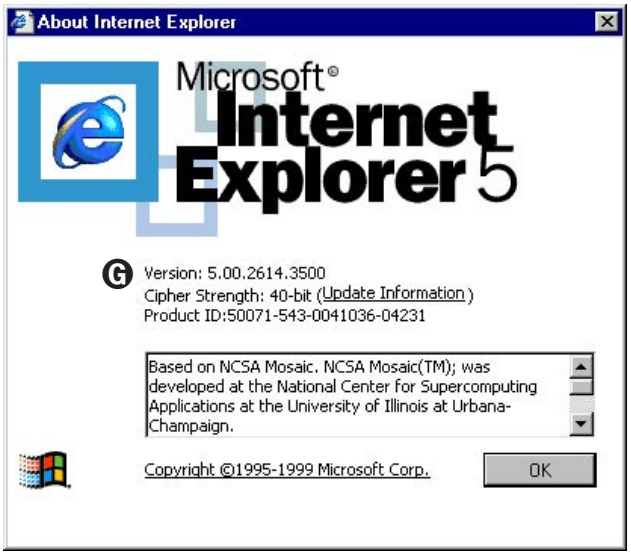


Internet Explorer™

The iPC utilizes the Internet Explorer web browser for its graphical interface. You must have Internet Explorer (IE) version 5.00 or higher. After staring Internet Explorer (IE), select the **Help** drop–down menu on the right side of the tool bar. From the drop–down list, select **About Internet Explorer**.

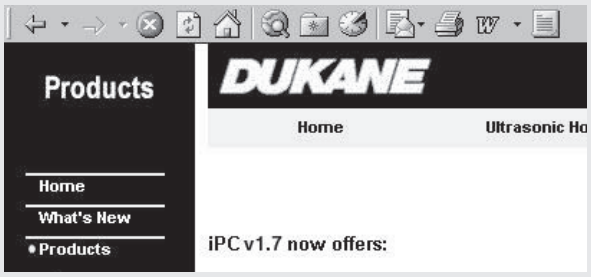


A new popup window will appear that displays the version number Ⓖ of the installed IE. Any version that is 5.00 or later will work.


About Internet Explorer
Microsoft®
Internet Explorer 5
Version: 5.00.2614.3500
Cipher Strength: 40-bit (Update Information)
Product ID:50071-543-0041036-04231
Based on NCSA Mosaic. NCSA Mosaic(TM); was developed at the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign.
Copyright ©1995-1999 Microsoft Corp.
OK

If you have an earlier version of IE, you can download the latest version of IE for free from Microsoft. It is not necessary to have the 128-bit cipher strength (used for on-line banking). The 40-bit cipher encoding will work just as well.

If you only see an icon bar across the top of the IE instead of a menu bar, then you are in Full–Page mode. Press the F11 key to toggle back to the standard menu bar.



CAUTION

The iPC program will not work with the Netscape Navigator browser. If you have Netscape, you can leave it installed, but you will also need Internet Explorer v5, v5.1, v5.5 or v6.

If your version of Internet Explorer is older than Version 5.00, an upgrade can be downloaded for free from Microsoft's website.

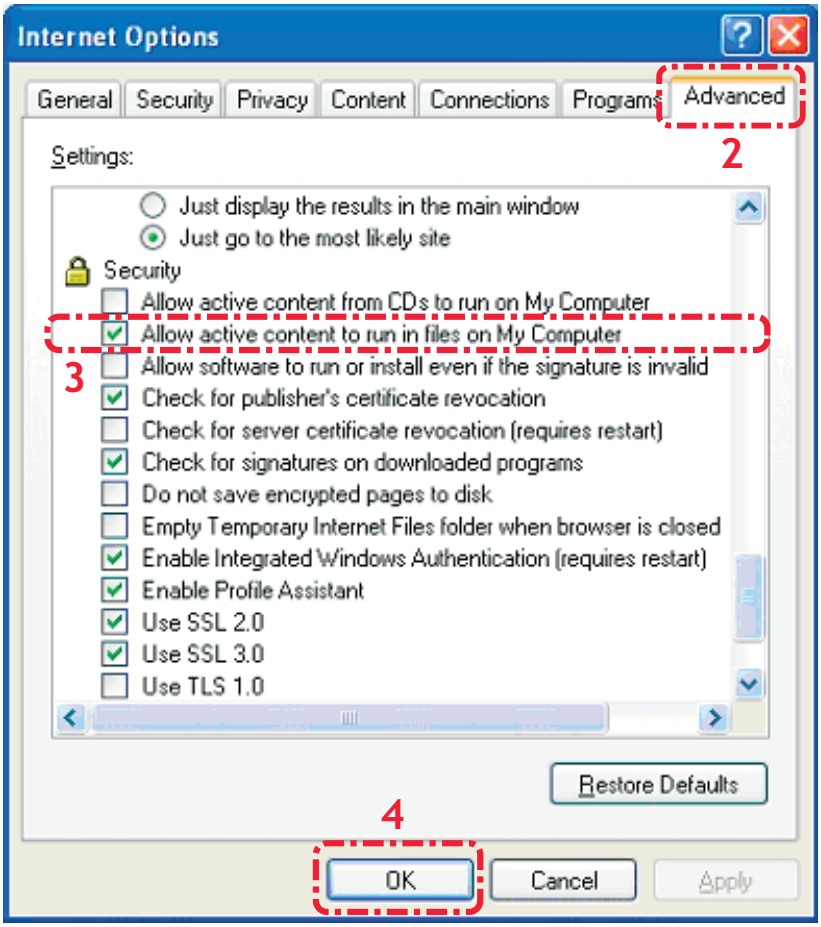
`http://www.microsoft.com/ie/downloads/search.aspx?displaylang=en` –or–

`http://www.microsoft.com/windows/ie/default.mspx`

IE6 With Windows XP SP2

If you are running Windows XP with the latest Service Pack 2 update, you will have to modify one setting in Internet Explorer 6. You can check if you have Service Pack 2 installed by selecting **My Computer** (see screen shot on page 24).

1. Start Internet Explorer 6, and from the **Tools** menu select **Internet Options...**
2. A new window named **Internet Options...** opens. Select the **Advanced** tab at the far right.
3. Under **Security** settings, confirm that the box labeled Allow active content to run in files on My Computer is checked as shown below.



4. Click the **OK** button at the bottom of the window. You can now close Internet Explorer.

SECTION 5

PC Configuration

- JAVA Virtual Machine
- Serial Port

JAVA Virtual Machine 29
Enable JAVA Console 30
Serial Port Settings 32

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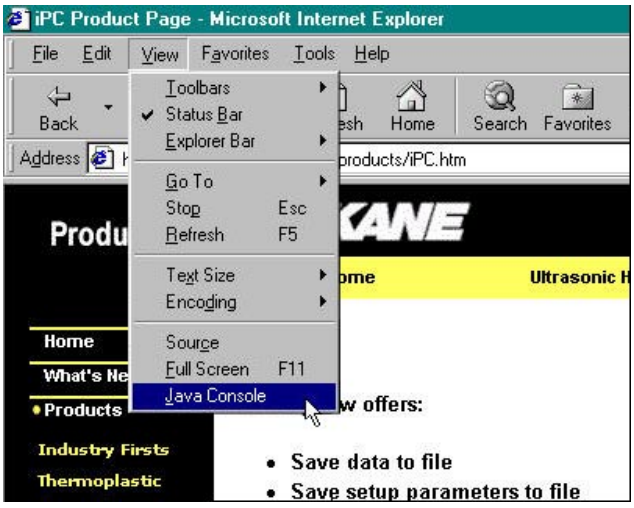
Java Virtual Machine

In order to run the iPC software, Microsoft's Virtual Machine for Java (JVM) 5.0 Release 5.0.0.3167 or higher must be installed and activated. The installed version of the JVM can also be identified from the Internet Explorer. After starting IE, select the **View** menu as shown. Then select **Java Console** from the list as shown below.



If **Java Console** is not present on the **View** drop–down list, then it has not been enabled in the Internet Explorer program. To enable the Java Console, follow the steps given on the next page, then return here to determine the version.

If the Java Console has been enabled, a new popup window will open as shown here. The version number is displayed at the top as shown at ❶.

Virtual Machine for JAVA —

The Java Virtual Machine (JVM) is a simulated computer. It runs on a host computer but behaves as if it is a separate computer. The Java Virtual Machine works as a self-contained operating environment to run Java applets, with the advantage that Java applets can be run independently from the host operating system. The JVM is what makes Java portable. A vendor such as Microsoft writes a JVM for their operating system (e.g. Windows XP), and any Java program can run on that JVM.

TIP —

A shortcut to launch Windows Explorer is to hold down to **Windows Key** and press the **E** key. Windows Explorer will open to the root directory of **My Computer** which contains **C:\iPC**

The **Windows** key has the icon

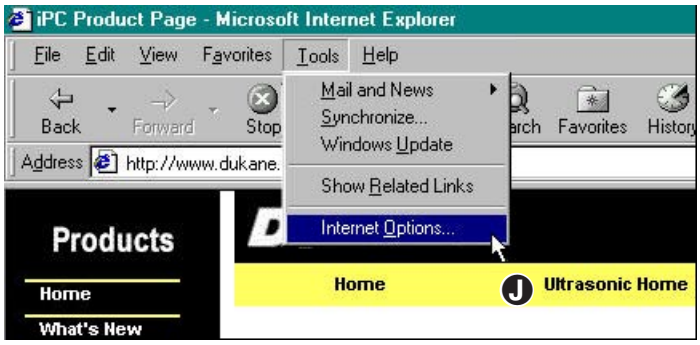
If your version of the JVM is older than Release 5.0.0.3167, a free update is available on the iPC CD.

1. Using Windows Explorer, open the **`Java VM`** folder **`(C:\iPC\JAVA VM)`**
2. Double click on **`msjavx86.exe`** and click the **Yes** button to install the Microsoft Java VM.
3. Click **Yes** to agree to the License Agreement.
4. After the installation is complete, click the **Yes** button to acknowledge installation.
5. Once the installation is complete, restart your computer for the changes to take effect.

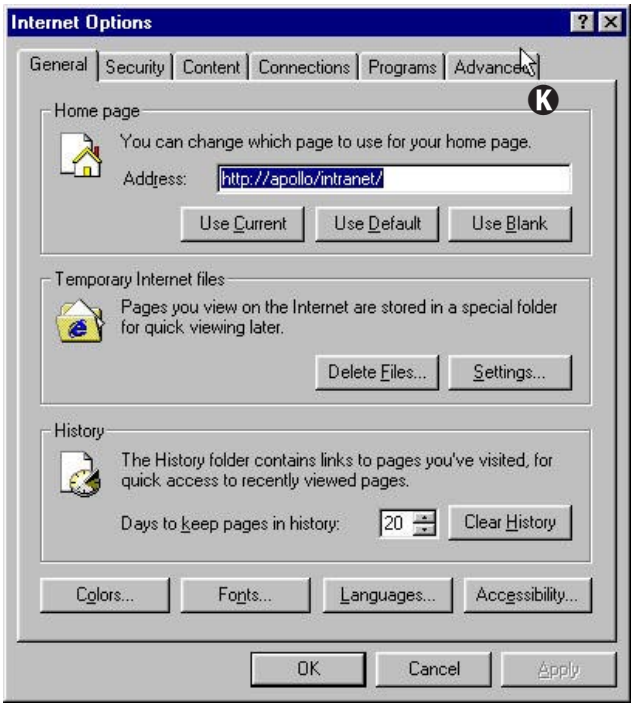
***i*PC** can detect if the Sun Micro Systems Java Virtual Machine is active. Although the JVM from Microsoft is based on the JVM from Sun, iPC is not compatible with Sun's JVM. The Sun JVM must be disabled. Microsoft's JVM implements some additional features specific to the Windows™ OS.

Enable Java Console

If the Java Console does not show up in the drop–down list under the View menu, then the control console has not been enabled. To enable the Java Console feature of Internet Explorer, go to the **Tools** menu of IE and select **Internet Options** ❶.

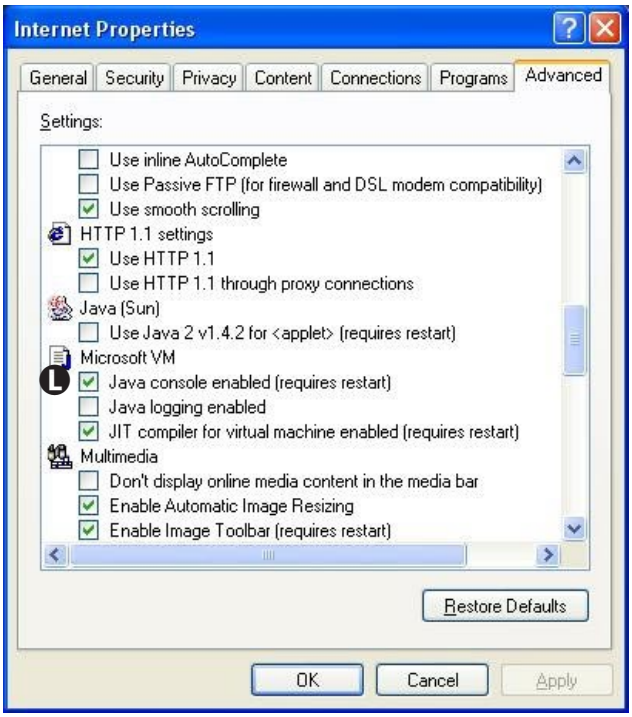


A new popup window opens with 6 tabs across the top. Click the **Advanced** tab ❶.


Internet Options
General Security Content Connections Programs Advanced
K
Home page
You can change which page to use for your home page.
Address: http://apollo/intranet/
Use Current Use Default Use Blank
Temporary Internet files
Pages you view on the Internet are stored in a special folder for quick viewing later.
Delete Files... Settings...
History
The History folder contains links to pages you've visited, for quick access to recently viewed pages.
Days to keep pages in history: 20 Clear History
Colors... Fonts... Languages... Accessibility...
OK Cancel Apply

Internet Options
General Security Privacy Content Connections Programs Advanced
K
Home page
You can change which page to use for your home page.
Address: http://www.dukcorp.com/us
Use Current Use Default Use Blank
Temporary Internet files
Pages you view on the Internet are stored in a special folder for quick viewing later.
Delete Cookies... Delete Files... Settings...
History
The History folder contains links to pages you've visited, for quick access to recently viewed pages.
Days to keep pages in history: 20 Clear History
Colors... Fonts... Languages... Accessibility...
OK Cancel Apply

A list of options with check boxes appears. Scroll half way down until you get to the Microsoft VM section. Check the **Java console enabled** box ❶.



If the Sun JVM is listed, make sure its box is not checked. Now click on the **OK** button to close the window. Exit Internet Explorer and restart your computer. Now when you start IE again and check the View menu, the Java Console should now be listed.

Java Logging —
Leave this feature unchecked. It is used mainly for debugging using the Java console window.

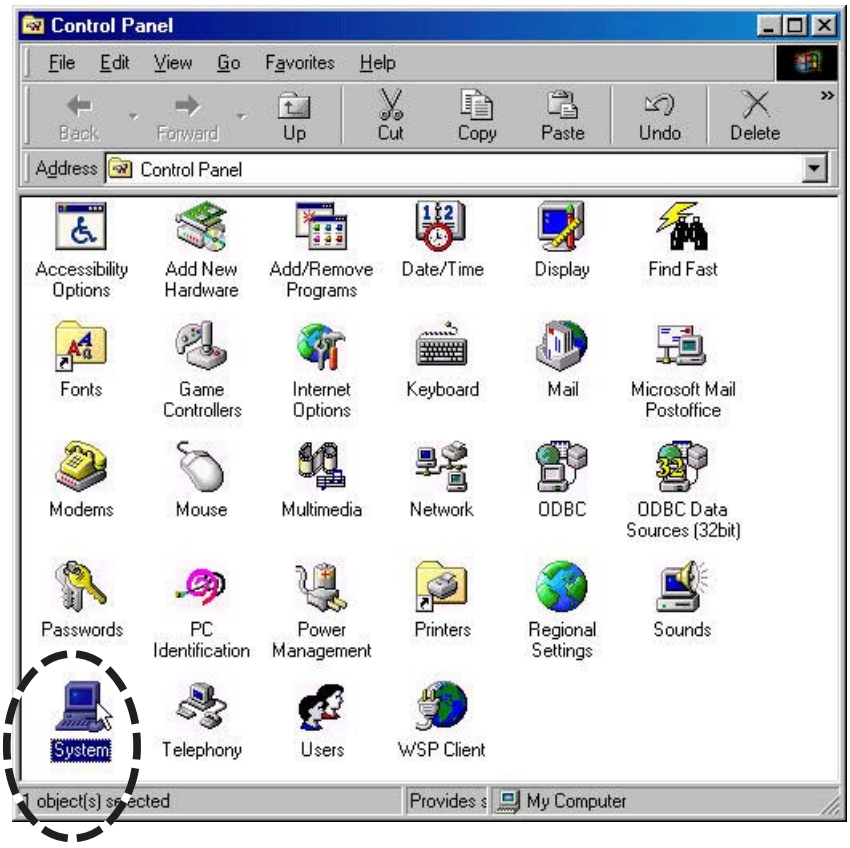
JIT Compiler —
This button should be checked.
The JIT (Just In Time) Compiler translates the bytecodes running in the JVM into the native binary code equivalent for the local computer and keeps this native code around as a cache for the next time the method is run. A system with JIT technology in place runs a lot faster.

NOTE —
You must restart Internet Explorer before the Java console will be enabled. Close all opened copies of Internet Explorer, and then start Internet Explorer again.

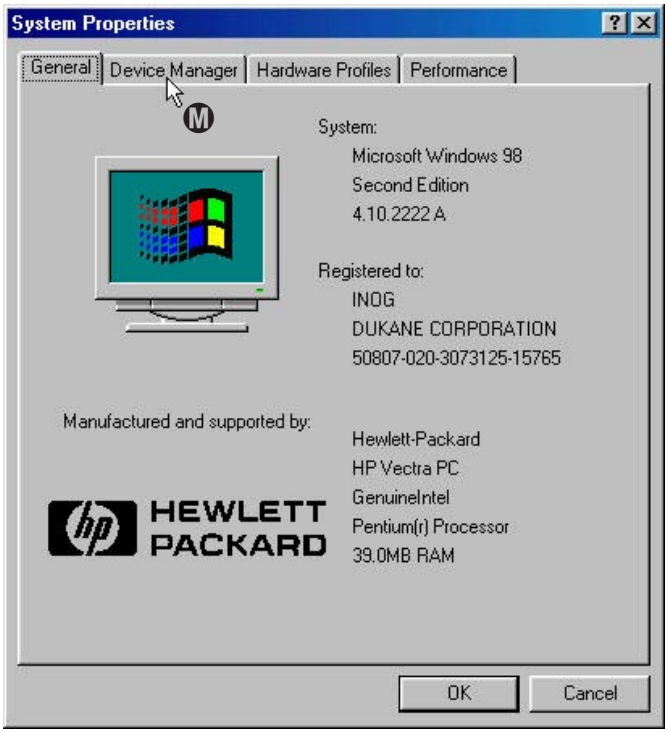
Serial Port Settings

The serial port settings of your PC must be correctly configured to establish a communication link with the serial port of the DPC. Earlier versions of iPC required you to configure these settings. Starting with v1.5, iPC sets all the seral port parameters itself, so this section is not needed. However it is included for reference.

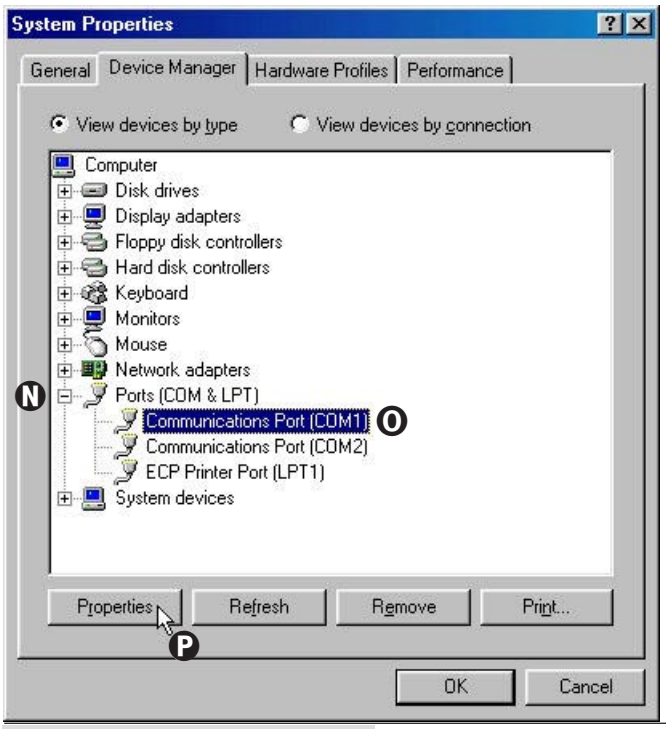
IMPORTANT –
Starting with version 1.5, iPC sets the serial port parameters itself. This section is included only for reference to earlier versions of iPC.



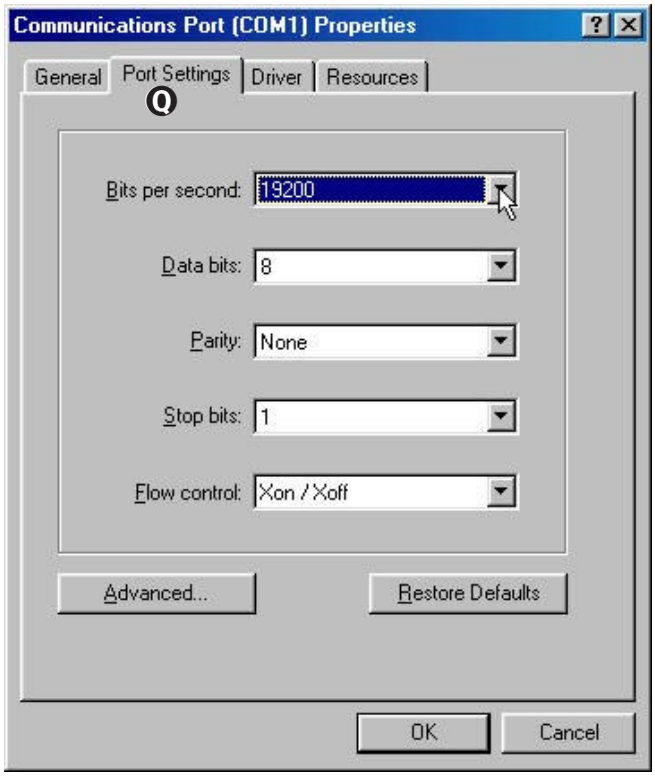
The iPC data rate must match the DPC setting. To verify or configure the PC serial port, select the **Control Panel** from the **Start** menu (refer back to page 19). When the **Control Panel** window opens, double–click the **System** icon to open its properties window. This is the same window we opened previously (on page 20) to check the Video display properties



Select the **Device Manager** tab Ⓜ, and the panel changes to display the device properties. Click on the plus sign Ⓝ next to the **Ports (COM & LPT)** box to expand the selection. Highlight the COM port Ⓞ that you will use on your PC to connect to the DPC. Now click the **Properties** button Ⓟ at the bottom left and a new window will open.

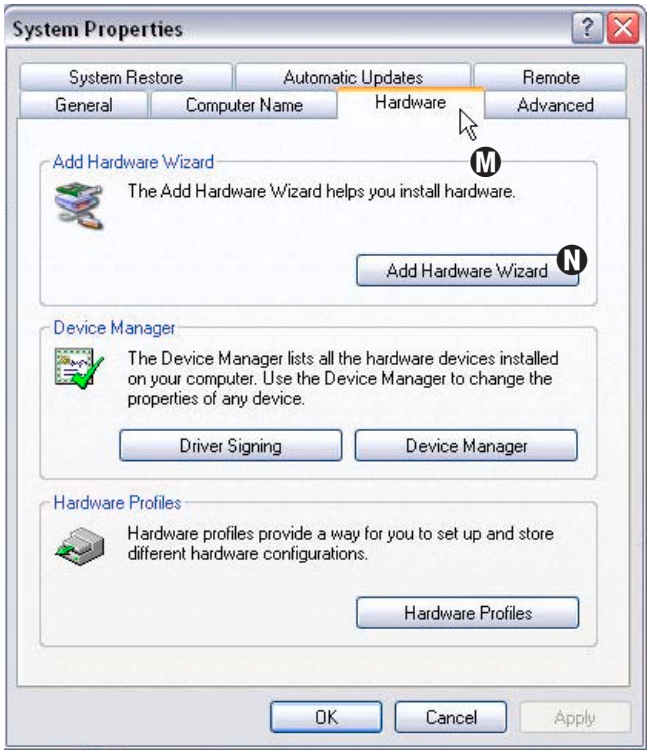


Select the **Port Settings** tab ⓠ to display the properties of the selected COM port. Confirm that your settings match those displayed in the window shown here. If they do not match, use the

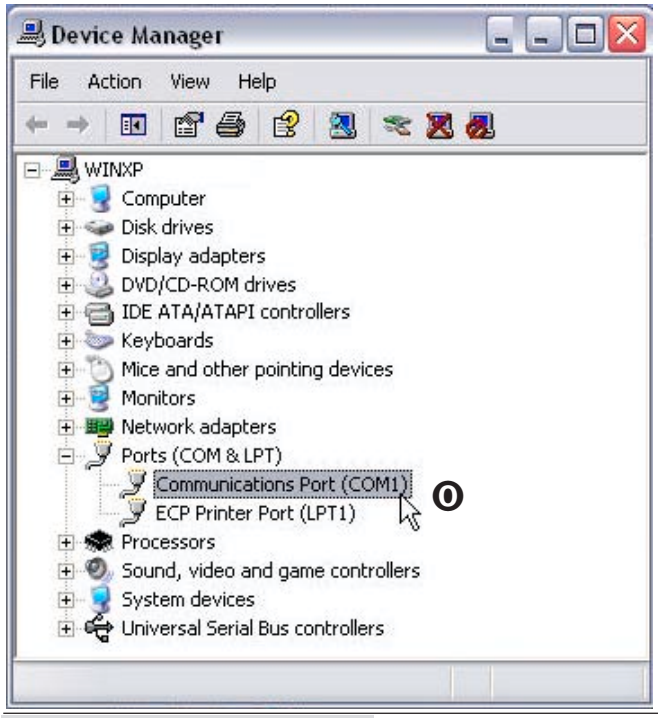


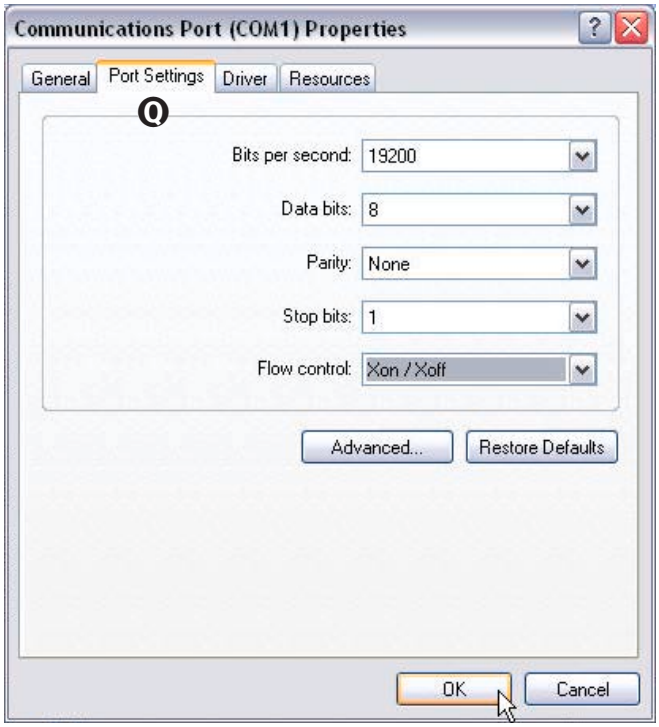
drop–down lists to select the correct values. Click the **OK** button to close this window, then click **OK** to close the **System Properties** window. Finally close the **Control Panel** window.

If you are using Windows XP, Select the **Hardware** tab Ⓜ, and the panel displays the Device Manager and Hardware Profiles.



Select the Device Manager button Ⓝ, and a new window appears listing the Ports. Double click on the Communications Port (COM1) Ⓞ.



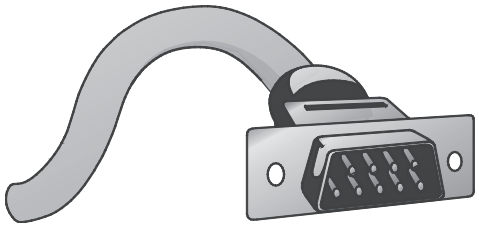


Select the **Port Settings** tab Q. Enter the values shown in the screen shot above. When you are finished, click the **OK** button. Then close the **Device Manager**, **System Properties** and **Control Panel** windows.

SECTION 6

Connect PC to DPC

- Serial Cable
- Network Configuration



Serial Cable Connection 39
DPC Network Connection 40

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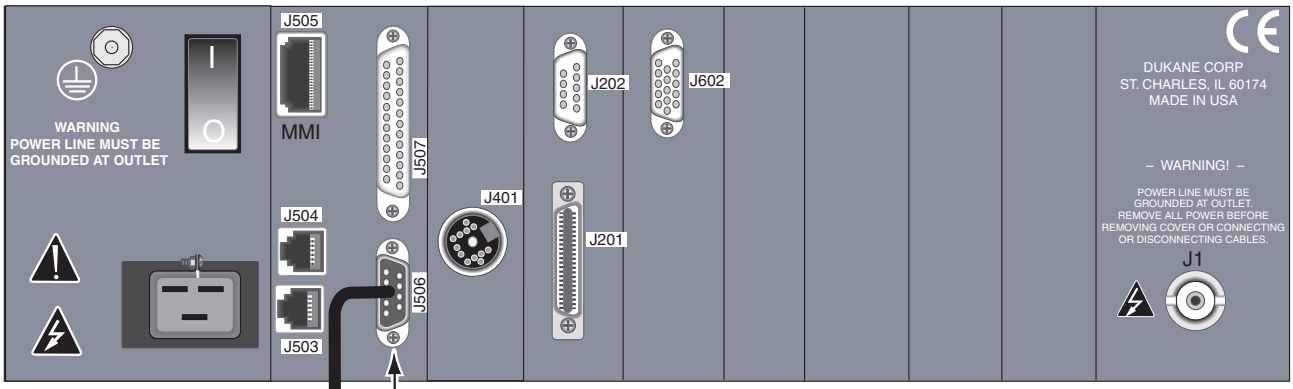
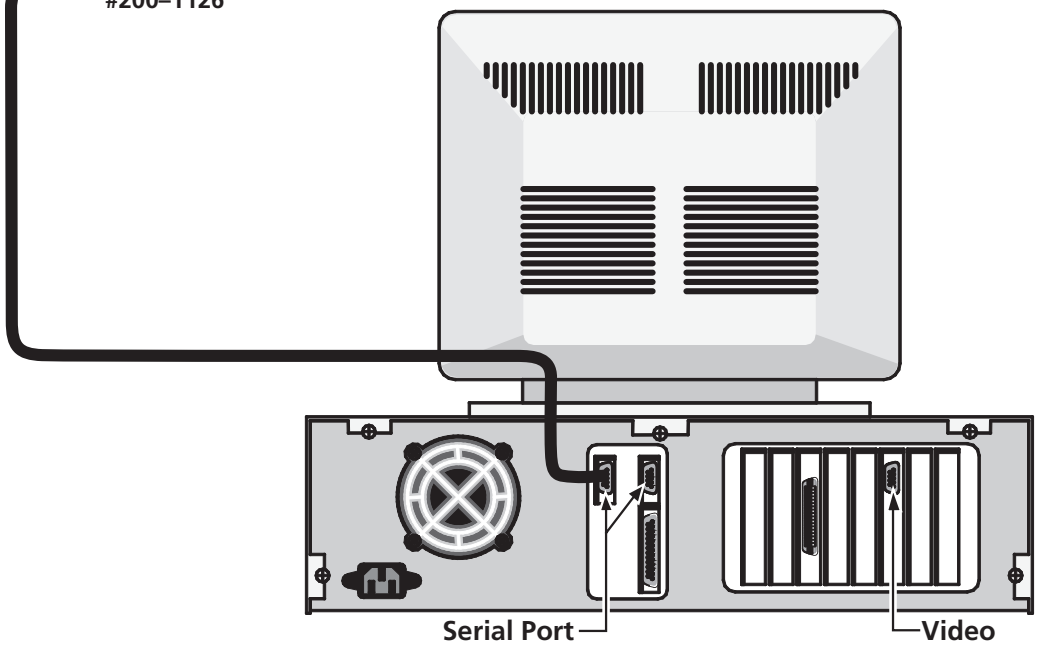
Serial Cable Connection

In order for the DPC IV and the iPC to communicate, a serial cable must be connected between the DPC and the PC. You must use the same serial port (COM1 or COM2) that you setup on pages 36–38. Connect the serial cable (Dukane Part No. 200-1126) from the DPC serial port (J506) to the correct COM port on the computer. The serial ports are identified on the rear panels in the illustration below.

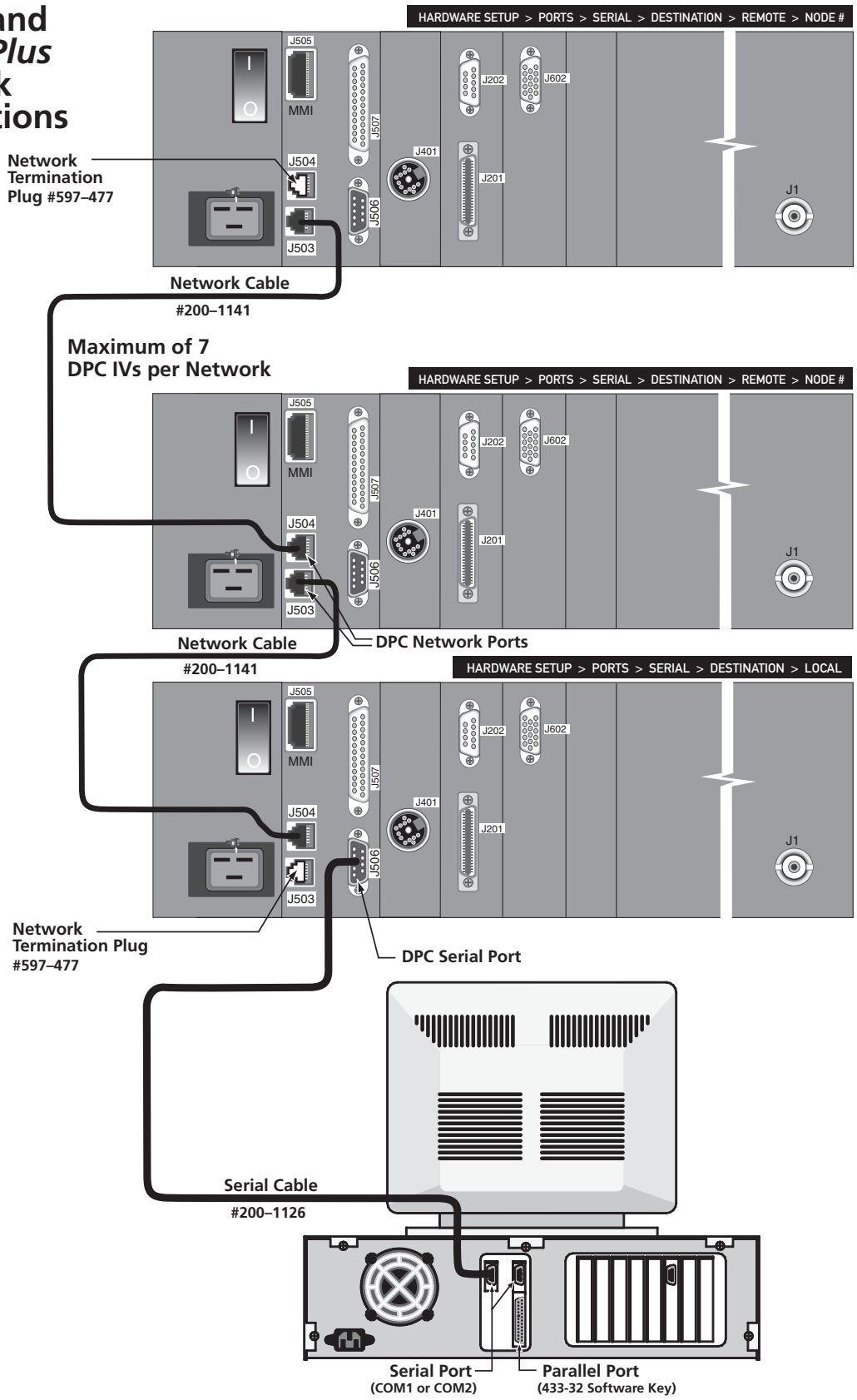




Typical PC Serial Port Location

DPC Network Connection

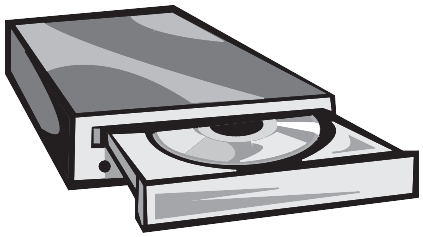
DPC IV and DPC IV *Plus* Network Connections



SECTION 7

iPC™ Installation

- Installing iPC v1.7
- Upgrading to iPC v1.7



Installing iPC v1.7 43
CD Documentation 43
Automatic Installation 43
Manual Installation 49
Upgrading to iPC v1.7 49
Upgrading From v1.3 or Later 49
Upgrading From v1.2 50
Upgrading From v1.1 52

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Installing iPC v1.7

CD Documentation

The iPC v1.7 CD-ROM contains three files which have a condensed version of the instructions in this manual. The files are readable using MicrosoftWORD. The first file, called **iPC Installation Guide.doc**, is a short, six–page configuration requirements document. The second file, **Final Release Notes for IPC1.7.doc** is an abbreviated installation guide. The thrid file, **Whats New in v1.7.doc** is a more detailed version of the data file format covered in Chapter 1.

Automatic Installation

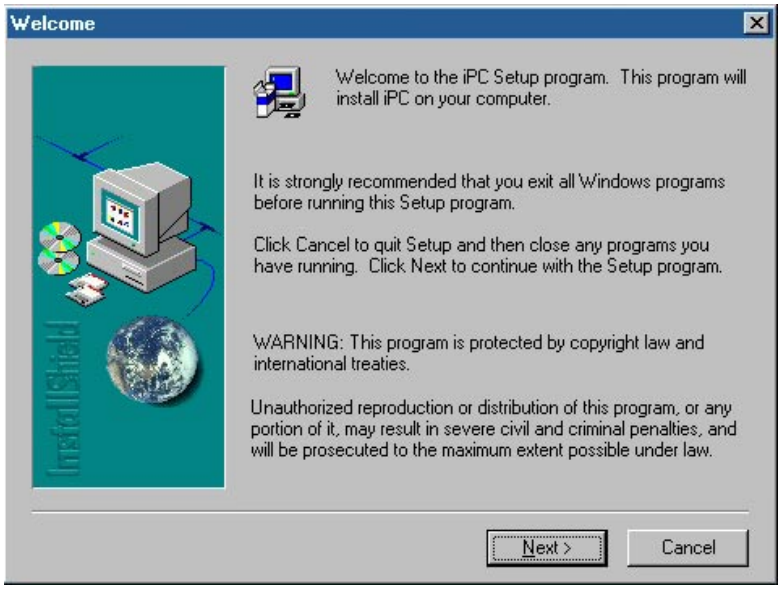
If you have never installed IPC v1.7 or if you have removed it from the system and do not have a version earlier than v1.3 currently installed, then follow these steps. If you have a version of iPC v1.2 or earlier installed, then skip to the section on upgrading iPC.

ALERT

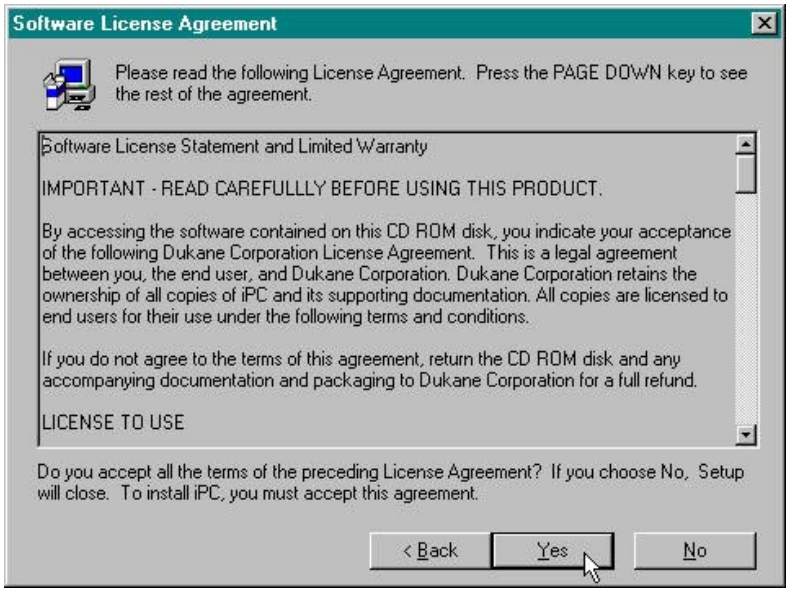
If the CD does not automatically begin installation, proceed to the next section – **Manual Installation** on page 49.

iPC ™
Version 1.70
Copyright © 2000 - 2004
Dukane Corporation
This program is protected by US and international copyright laws.

Quit any programs you have running. Place the CD-ROM containing the iPC v1.7 software into the CD drive of the computer. The installation program will begin automatically. An iPC splash screen appears which shows the current version, and the Setup window shows the progress of the

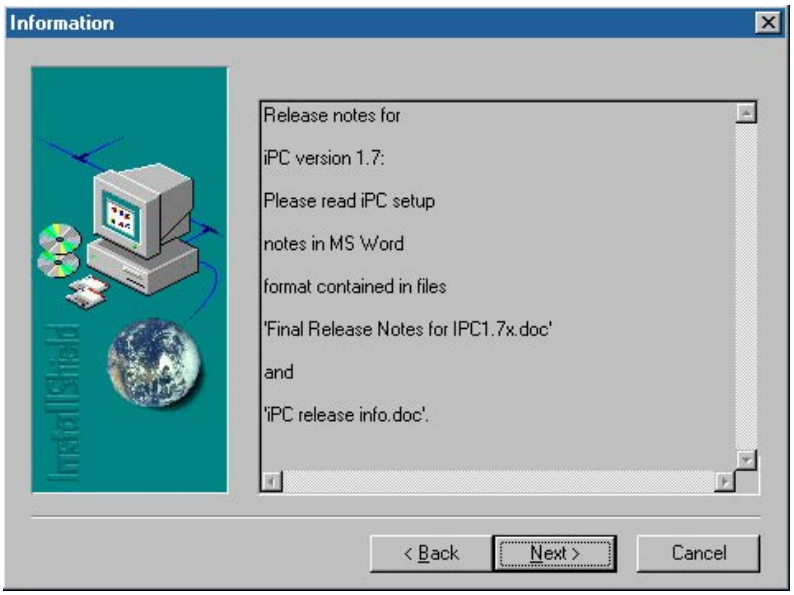

Welcome
Welcome to the iPC Setup program. This program will install iPC on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

installation. Next, the screen refreshes and a **Welcome** window appears reminding you to exit any other running programs if you haven't

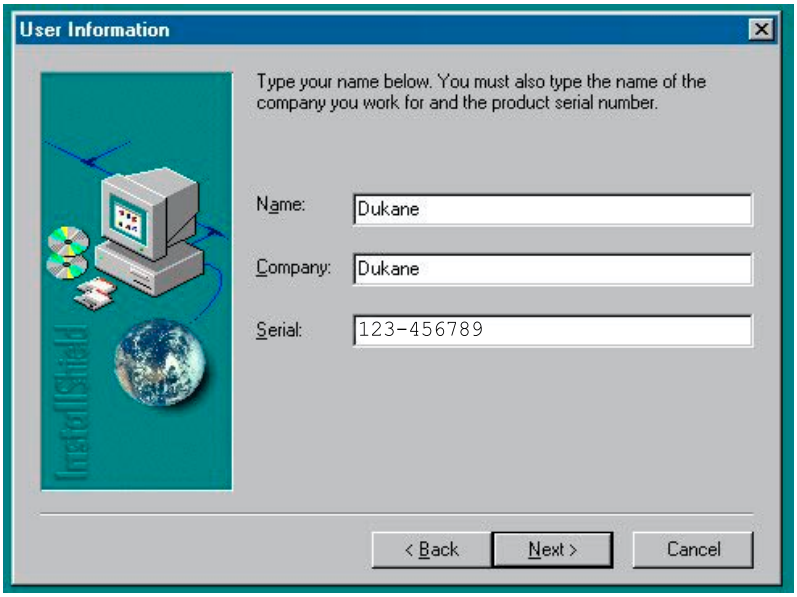

Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
Software License Statement and Limited Warranty
IMPORTANT - READ CAREFULLLY BEFORE USING THIS PRODUCT.
By accessing the software contained on this CD ROM disk, you indicate your acceptance of the following Dukane Corporation License Agreement. This is a legal agreement between you, the end user, and Dukane Corporation. Dukane Corporation retains the ownership of all copies of iPC and its supporting documentation. All copies are licensed to end users for their use under the following terms and conditions.
If you do not agree to the terms of this agreement, return the CD ROM disk and any accompanying documentation and packaging to Dukane Corporation for a full refund.
LICENSE TO USE
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install iPC, you must accept this agreement.
< Back
Yes
No

done so already. Click the **Next** button when you are ready to proceed. Next the **Software License Agreement** appears. Click **Yes** if you agree to the terms in the license.

Next the **Information** window is displayed which provides the iPC version number and information about the release notes (see page 47 for file description). Click the **Next** button to proceed.



The **User Information** window appears next. Enter your name, the company name and the serial number that appears on the case which the CD was shipped in. If you do multiple installations on different computers, use the same serial number. When you have finished entering the information, click the **Next** button to proceed.



The next window gives you the option of changing the default location of the iPC installation. If you select another path using the **Browse...** button such as **`C:\Program Files\iPC`**, remember the location. The iPC will save all its parameter setup files in the root of its installation directory. The default value is **`C:\iPC`** as shown in the window below. If you select an alternate location, be sure to include the **`\iPC`** path at the end to place the files in their own separate directory.

TIP —
Do not confuse the forward slash / used for internet web address with the backslash \
All DOS and Windows paths use the backslash.
e.g. `C:\Program Files\iPC`

Choose Destination Location
Setup will install iPC in the following folder.
To install to this folder, click Next.
To install to a different folder, click Browse and select another folder.
You can choose not to install iPC by clicking Cancel to exit Setup.
Destination Folder
c:\iPC
Browse...
< Back
Next >
Cancel
InstallShield

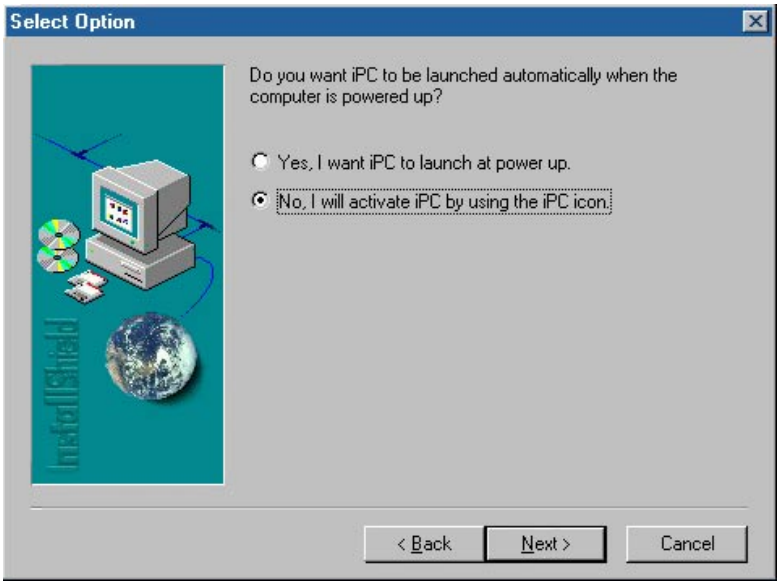
Once you have decided on a location, click the **Next** button to continue with the installation. In the **Setup Type**, choose **Typical** and click **Next**.

Setup Type
Click the type of Setup you prefer, then click Next.
Typical
Program will be installed with the most common options. Recommended for most users.
Compact
Program will be installed with minimum required options.
Custom
You may choose the options you want to install. Recommended for advanced users.
< Back
Next >
Cancel
InstallShield

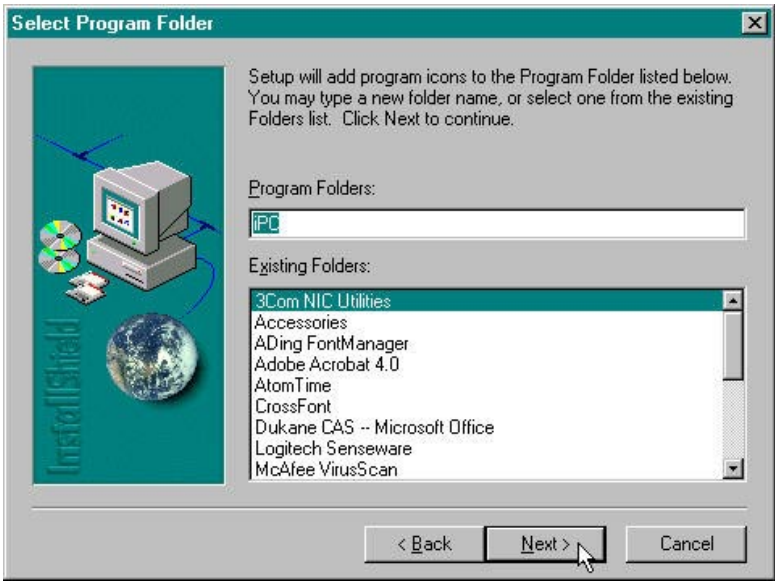
IMPORTANT –
By default, the iPC saves files to the directory where the iPC was installed. The default location for installation and saved files is **C:\iPC**

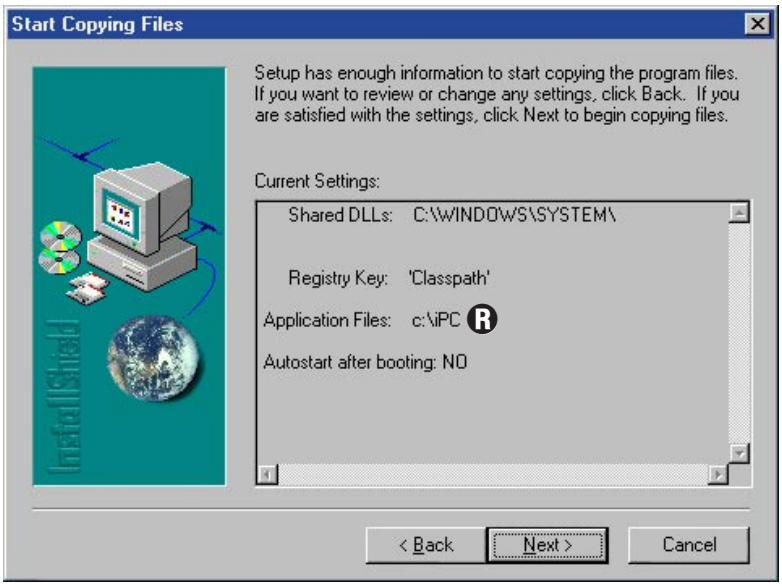
If you installed the iPC to another directory (e.g. C:\Program Files\iPC) then all files will be saved to that directory.

Next, decide if you want iPC to start automatically each time the computer is turned on. Click **Yes** or **No** and click **Next**.


Select Option
Do you want iPC to be launched automatically when the computer is powered up?
Yes, I want iPC to launch at power up.
No, I will activate iPC by using the iPC icon.
InstallShield
< Back
Next >
Cancel

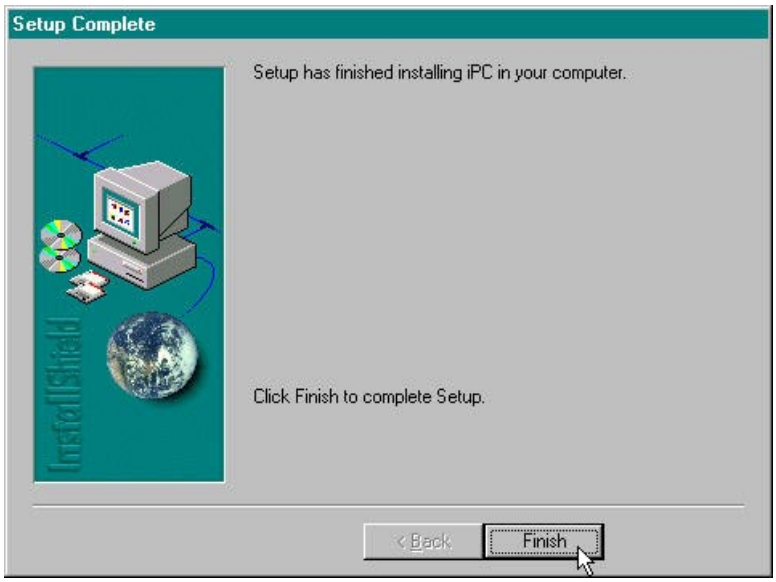
In the **Select Program Folders** window, accept the default values and click **Next**.




Start Copying Files
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Current Settings:
Shared DLLs: C:\WINDOWS\SYSTEM\
Registry Key: 'Classpath'
Application Files: c:\iPC
Autostart after booting: NO
< Back
Next >
Cancel

The next window confirms the choices we have made regarding the iPC program file location ⓡ. Click the **Next** button to begin installation of the iPC files.

The screen refreshes and the files are copied to the computer hard disk. A progress bar indicates the status. Once the files have been copied, a **Setup Complete** window appears. Click the **Finish** button to complete the installation.



The setup window automatically closes and returns you to the desktop. You can now remove the CD from its drive. If you have DPC IV firmware version 3.30, v3.33, v3.40 or v3.50, you will need the CD again in order to upgrade the firmware. If you have DPC IV firmware v3.60 (or DPC IV Plus v4.20), you can put the CD back in its protective case and store it in a safe place.

Manual Installation

If the CD does not automatically begin the installation of the iPC, follow these steps which are also printed on the CD–ROM. See page 23 to orient yourself with the **Start** and **Run** menu.

1. Click on **Start**
2. Select **Run...**
3. Type **`D:\install`**
4. Select **OK**

TIP —
The CD drive is typically the D drive. If however your CD drive is E, F or G, use the appropriate letter in place of D to manually install the iPC.
e.g. `E:\install`

Also, do not confuse the back slash \ used for all DOS and Windows paths with the forward slash / used for internet web address.

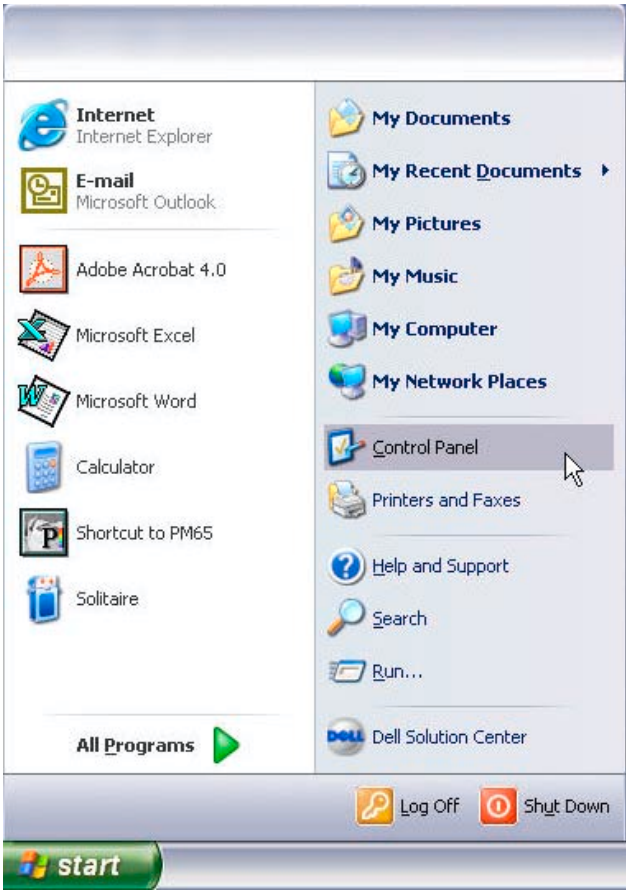
NEW FEATURES —
Version 1.7 features many improvements.

1. iPC now works on both local and remote DPCs.
2. Save part data to comma delimited (*.csv) files which can be opened by EXCEL.
3. Now able to save DPC graphic data to a file.
4. View real–time parameters from the Operate page.
5. Print setup now available on Utilities page.

Upgrading to iPC v1.7

Upgrading From iPC v1.3 or Later

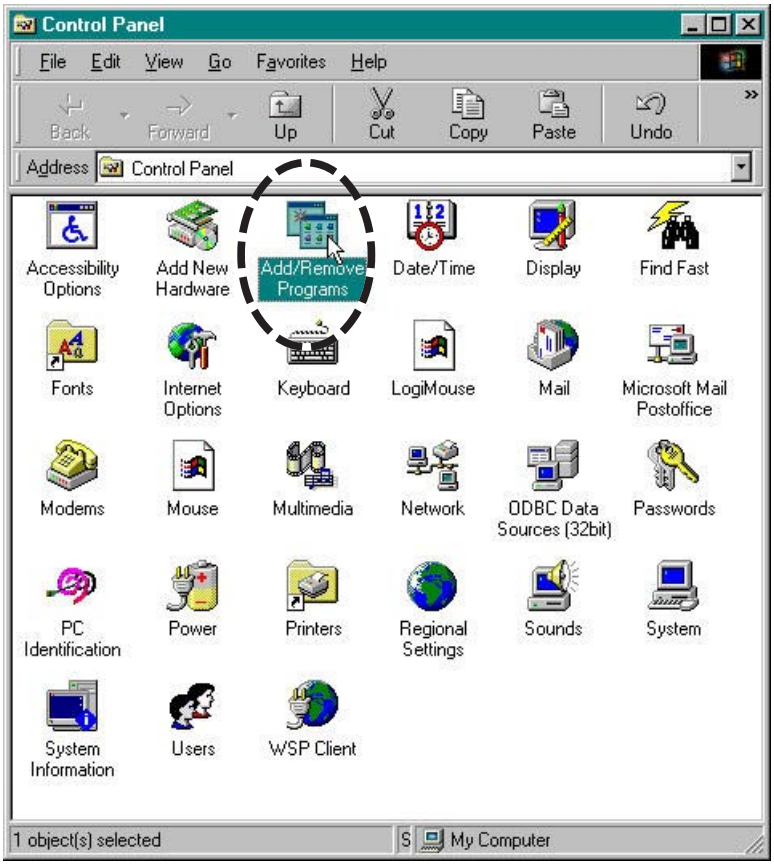
To upgrade from iPC v1.3, v1.4, v1.5 or v1.6, you do not need to uninstall the older version of iPC. Follow the instructions at the beginning of this section for automatic or manual installation.



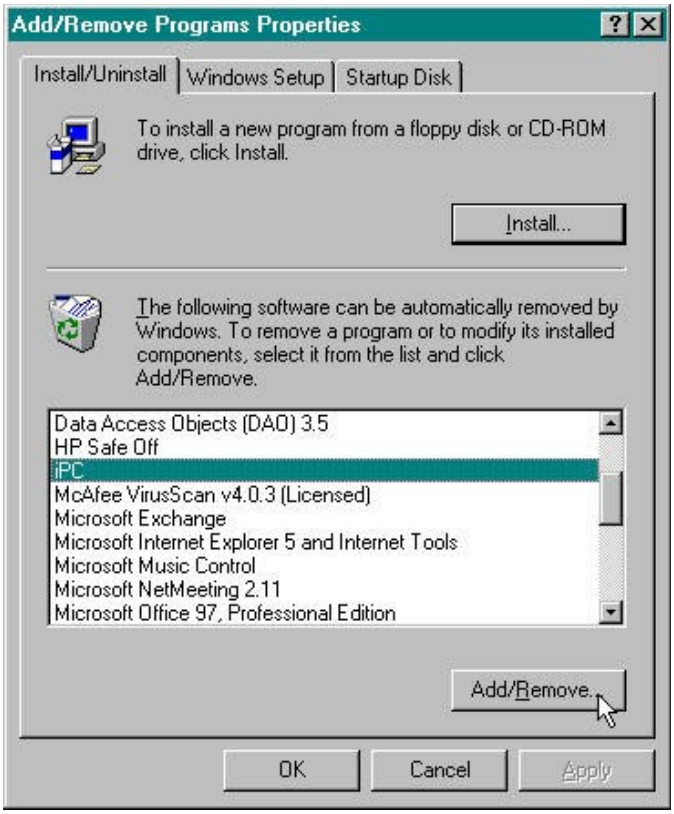
Upgrading From iPC v1.2

To upgrade from v1.2, you need to first uninstall iPC v1.2. Left click on **Start**. Select **Settings** then **Control Panel**.

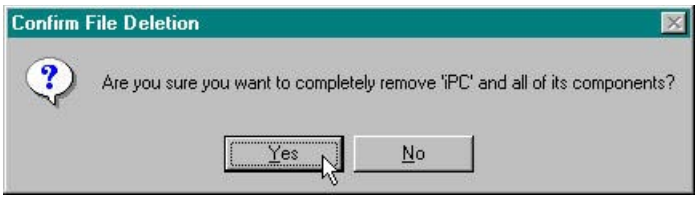
The **Control Panel** opens in a separate window as shown in the figure below. Double click on the **Add/Remove Programs** icon.



A new window titled **Add/Remove Programs Properties** will open as shown on the next page.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Data Access Objects (DAO) 3.5
HP Safe Off
iPC
McAfee VirusScan v4.0.3 (Licensed)
Microsoft Exchange
Microsoft Internet Explorer 5 and Internet Tools
Microsoft Music Control
Microsoft NetMeeting 2.11
Microsoft Office 97, Professional Edition
Add/Remove...
OK
Cancel
Apply

Scroll down until you locate **iPC** and select it from the list. Click the **Add/Remove...** button. Another window opens asking you to confirm deletion of the **iPC** program. Click the **Yes** button.



When the iPC program has been deleted, Close the **Add/Remove Programs Properties** window and close the **Control Panel** window.

Open **Windows Explorer** and rename the **iPC** folder to **Old_iPC** or something like that. This will retain any setup files you have until you are satisfied the upgrade has been completed. Now follow the instructions at the beginning of this section for installing iPC v1.7. When installation of iPC v1.7 is completed, copy the setup files from **Old_iPC** to the new **iPC** folder.

NOTE —
A shortcut to launch Windows Explorer is to hold down to **Windows Key** and press the **E** key. Windows Explorer will open to the root directory of **My Computer** which contains **C:\iPC**

The **Windows** key has the icon

Upgrading From iPC v1.1

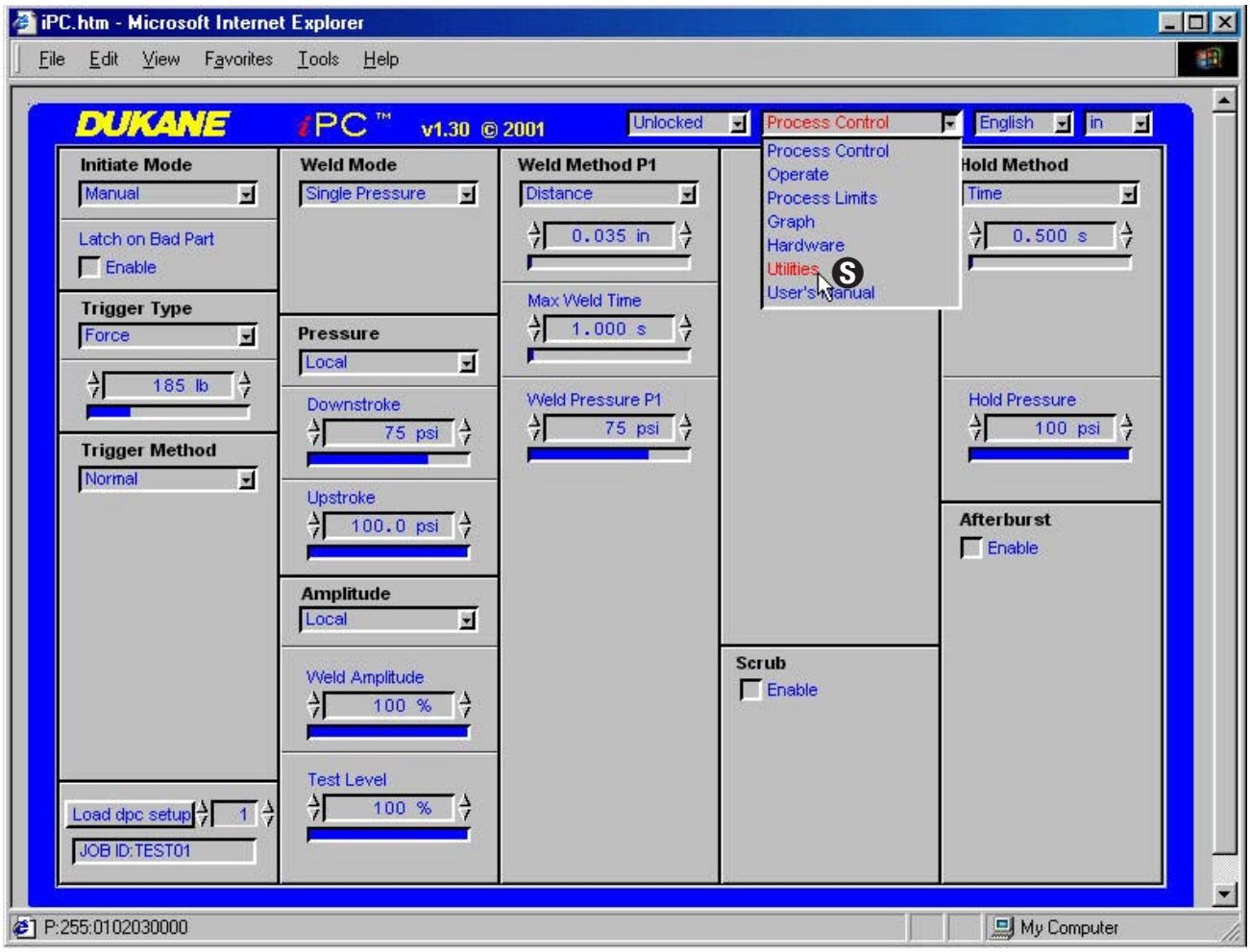
To upgrade from v1.1, you first need to back up your setup files before upgrading. There was a file format change between iPC v1.1 and v1.2, so setup files from v1.1 will not work with iPC v1.2 or later. In order to reuse the v1.1 files, you must store the files in their native format in DPC and then reload them once iPC v1.7 is installed.

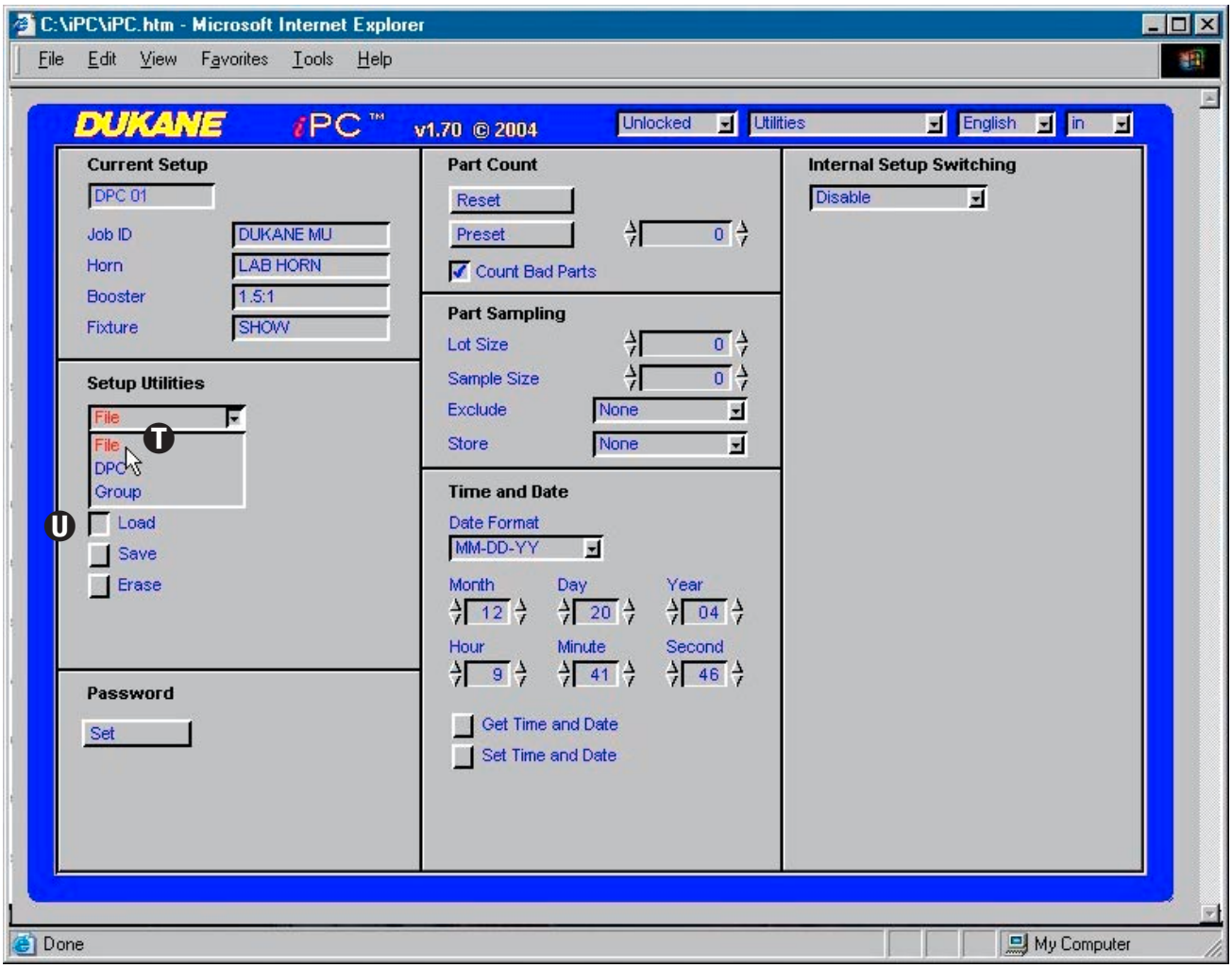
1. **Load and Save Setup Files in DPC**
2. **Uninstall iPC v1.1**
3. **Install iPC v1.7**
4. **Copy and Save Setup Files back to iPC.**

1. Load & Save Setup Files in DPC

Make sure the DPC is turned on and connected to the PC. Launch iPC v1.1 and open the **Utilities** page Ⓢ.

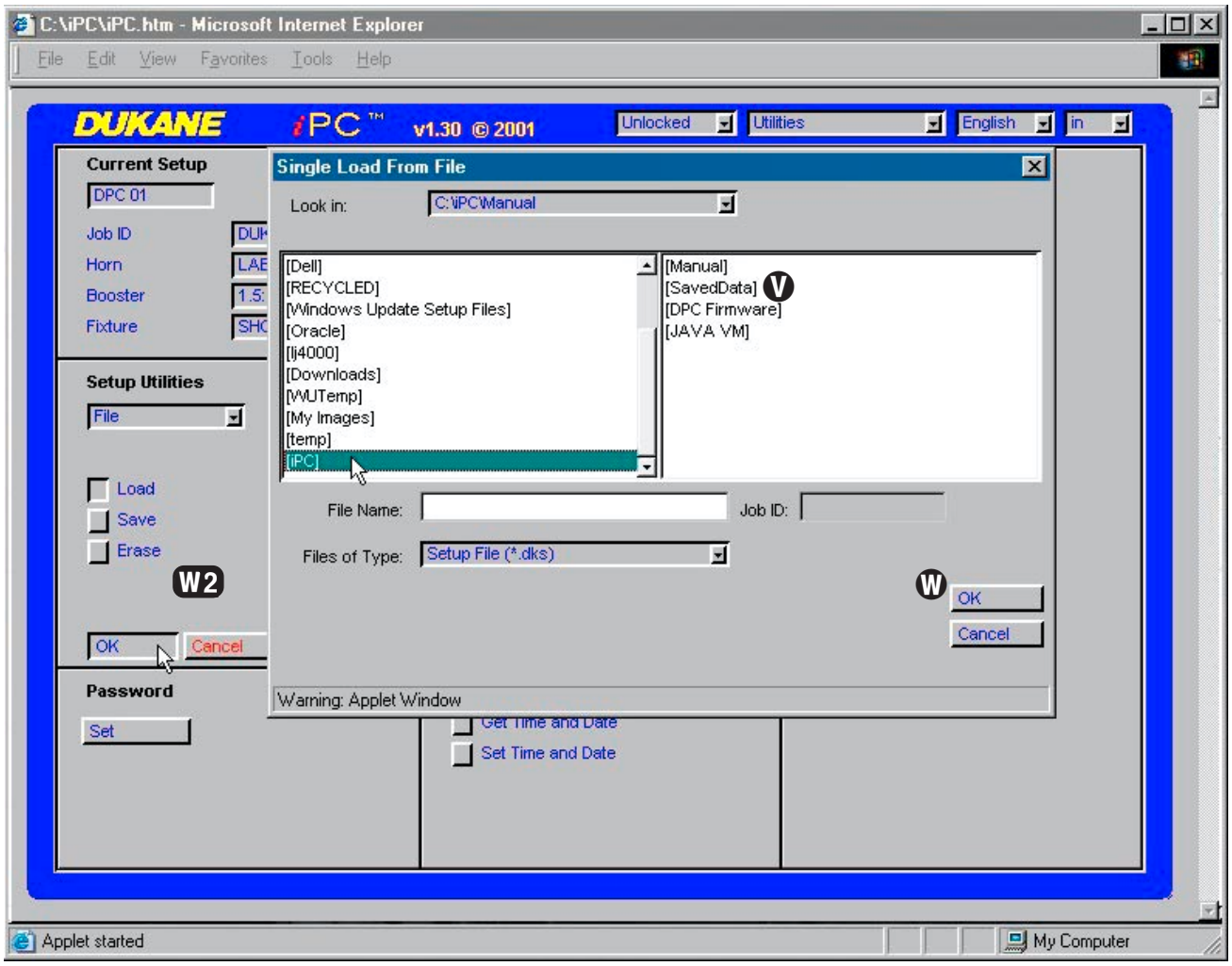
NOTE —
If you are unsure of how to start the iPC, refer to "Launching iPC Software" in Section 9.





On the **Utilities** page, select **File** ⓣ and then select the **Load** box ⓤ. This will open a new window for you to select the file to be loaded (see next page).

The files should be located in the **SavedData** directory Ⓥ. Open the directory and select the first file and click OK Ⓦ in the directory window. When the window closes, click OK W2 in the iPC window. This will retrieve the first file from computer hard disk and transfer it to the DPC memory.



Repeat this procedure for each setup file that is not saved in the DPC. Remember the DPC can hold a maximum of 25 files.

The terminology of **Load** and **Save** can be confusing because it does not specify which device files are being saved from or to.

File refers to computer hard disk operations. The iPC can store a maximum of 100 setup files.

File > Save means to save to the hard disk. The settings currently in the iPC Process Control page are saved on the computer hard disk.

File > Load means to read from the hard disk, load the files to the DPC memory and display them on the iPC Process Control page.

DPC refers to operations in the DPC memory. The DPC can saves a maximum of 25 files in its memory.

DPC > Save refers to operations from one DPC setup to another DPC setup. The existing setup in the DPC is replaced by the settings currently in the iPC. The new settings overwrite the existing DPC settings.

DPC > Load means to change from one DPC setup to another setup. This retrieves a setup file in the DPC and loads it into the iPC. The existing settings in the DPC are overwritten by the new settings.

Setup is a file containing a complete set of parameter values required to configure a DPC. Each file is written to the hard disk in XML format.

Save DPC Setups to PC Hard Drive —

1. **DPC > Load** retrieves a setup file from the DPC and loads it in the iPC.
2. **File > Save** stores the setup file currently displayed in the iPC to the computer drive.

Copy Setups From PC to DPC Memory —

1. **File > Load** retrieves a setup file from the computer drive and loads it in the iPC.
2. **DPC > Save** stores the setup file currently displayed in the iPC to the DPC with the specified setup number

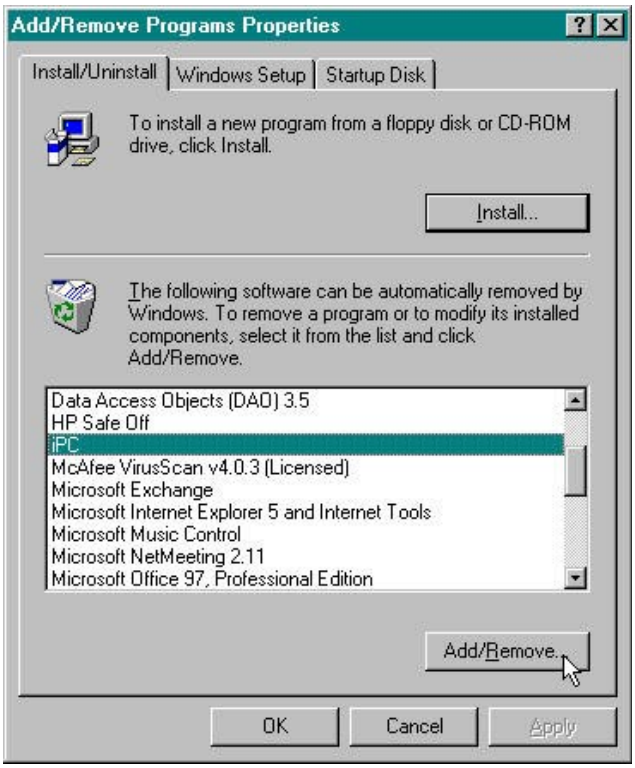
XML —
Extensible Markup Language is a method for putting structured data in a text file. XML is conceptually related to HTML, but XML is not itself a markup language. Rather it is a metalanguage, a language used to create other specialized languages. Like JAVA, XML is platform independent. You can examine an XML setup file by using a text editor such as NOTEPAD.

2. Uninstall iPC v1.1

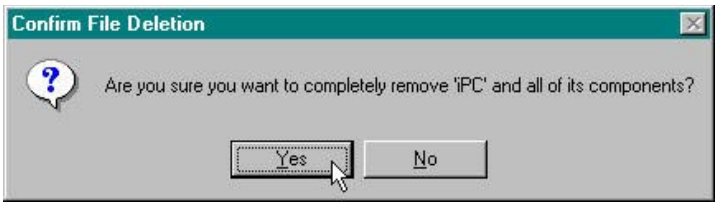
After you have transferred all your setup files to the DPC, you will need to uninstall iPC v1.1. The files are stored in nonvolatile memory in the DPC. Left click on **Start**. Select **Settings** then **Control Panel**.

The **Control Panel** opens in a separate window as shown in the figure below. Double click on the **Add/Remove Programs** icon.

A new window titled **Add/Remove Programs Properties** will open as shown on below.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Data Access Objects (DAO) 3.5
HP Safe Off
iPC
McAfee VirusScan v4.0.3 (Licensed)
Microsoft Exchange
Microsoft Internet Explorer 5 and Internet Tools
Microsoft Music Control
Microsoft NetMeeting 2.11
Microsoft Office 97, Professional Edition
Add/Remove...
OK
Cancel
Apply

Scroll down until you locate **iPC** and select it from the list. Click the **Add/Remove...** button. Another window opens asking you to confirm deletion of the **iPC** program. Click the **Yes** button.



When the iPC program has been deleted, Close the **Add/Remove Programs Properties** window and close the **Control Panel** window.

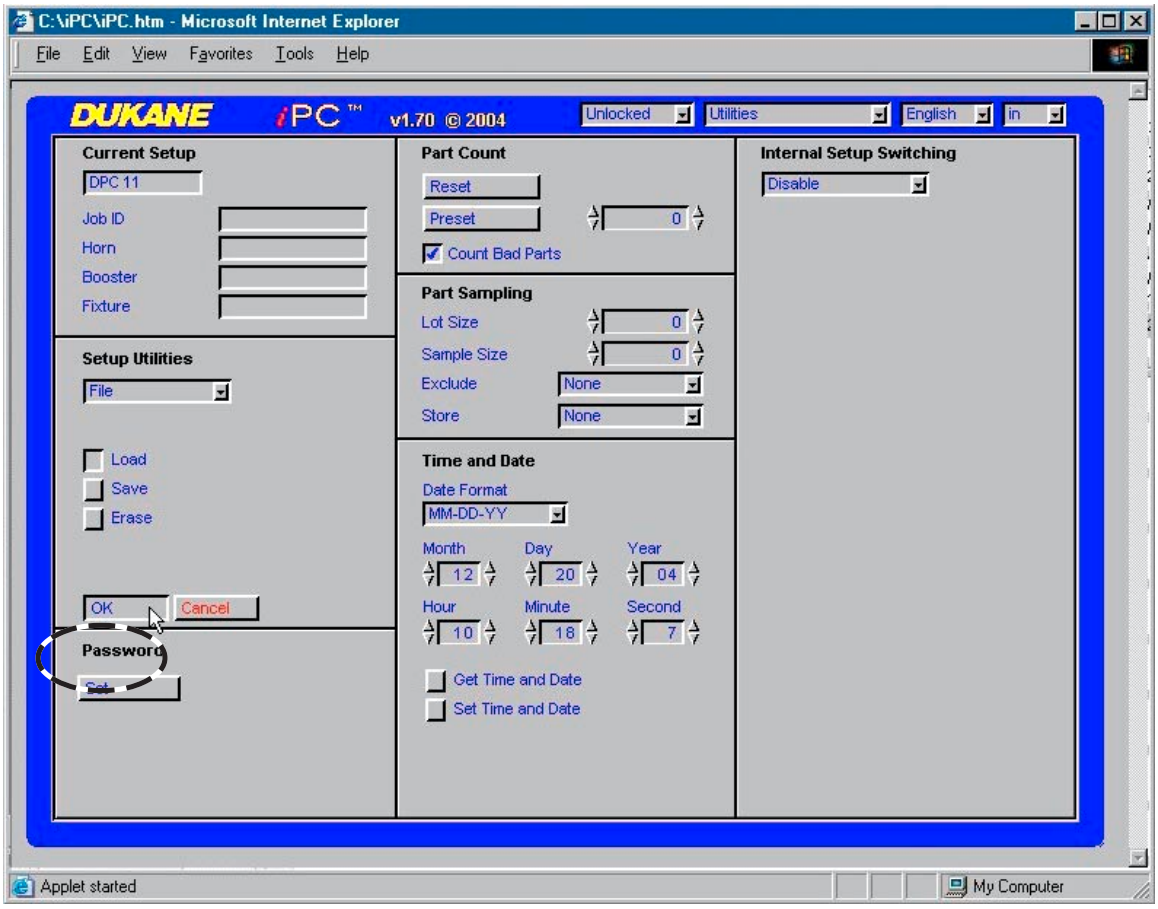
Open **Windows Explorer** and rename the **iPC** folder to **Old_iPC** or something like that. This will retain your old setup files. Even though the setup files are not directly readable by iPC v1.7, keep a copy of them until you are satisfied that the v1.7 upgrade has been satisfactorily completed.

3. Install iPC v1.7

Now follow the instructions at the beginning of this section for installing iPC v1.7, then return here to complete step 4.

4. Transfer Setup Files Back To PC

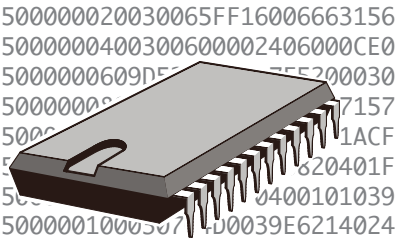
To transfer your DPC setup files back to the computer and iPC, reverse the process of loading the files.. To transfer your setup files, first open the **Utilities** page Ⓢ. On the **Utilities** page, select **File** Ⓣ for each setup file you saved to the DPC. Select the **Load** box Ⓤ and a new window opens to displays a directory of files. Select a **File** Ⓥ then click the **OK** button Ⓦ in the directory window. Then click the OK button in the iPC window. Use the same file numbers to restore the files as you used to save them. You can use Windows Explorer to navigate to `C:\iPC` (or the directory you choose to install iPC) to view the files. You can sort the files by type or by date modified to group them and verify the file names.



SECTION 8

DPC Firmware Upgrade

- DPC Service Upgrade
- Updating DPC Firmware



DPC v3.60 Firmware 61
DPC v3.20 Firmware 61
DPC v3.30 – v3.50 Firmware 61
Possible Problems 67

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DPC v3.60 Firmware

No update is needed for firmware revision v3.60 (DPC IV) or v4.20 (DPC IV *Plus*) to run iPC v1.7.

DPC v3.20 Firmware

For firmware versions 3.20 and earlier, an internal service upgrade may be required before the DPC firmware can be safely updated. The service upgrade is handled through the Service Department (see Section 11 for contact information). Failure to upgrade the DPC internally and updating the DPC v3.20 firmware may result in a successful firmware update, but unpredictable or total failure of stored DPC process setup files.

DPC v3.3– v3.5 Firmware

If your DPC IV has firmware revision v3.30, v3.33, v3.40 or v3.50, you may proceed to rewrite the Flash Memory in the DPC IV by using the software contained on the iPC v1.7 CD. You will first need to copy the required file from the CD to your computer hard disk. Do not try to use the DPC4 Plus software – dpcv4p20.txt. The DPC IV does not enough memory to hold the IV Plus program. Trying to use the DPC IV Plus software in a DPC IV will result in nonfunctional DPC IV !

1. Locate the folder on the iPC v1.7 CD–ROM named **DPC Firmware.** Copy the folder from the CD (**D:** drive) to the **iPC** folder on your computer's **C:** drive.
2. Now, open the **DPC Firmware** folder on the **C:** drive. There are three text files. We are only interested in verifying that there is one file named **dpcv3p60.txt.** To be safe, delete the other two files before continuing.

CAUTION

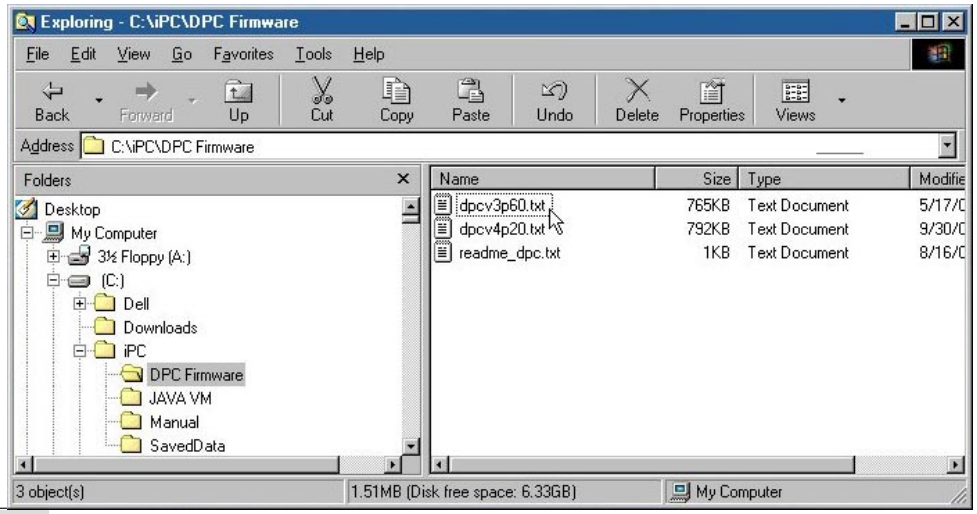
Do not attempt to update DPC v3.20 or earlier firmware without first contacting the Service Department.

If you are instructed to return a DPC printed circuit board to Dukane, print out or write down all your DPC setup parameters before returning the board.

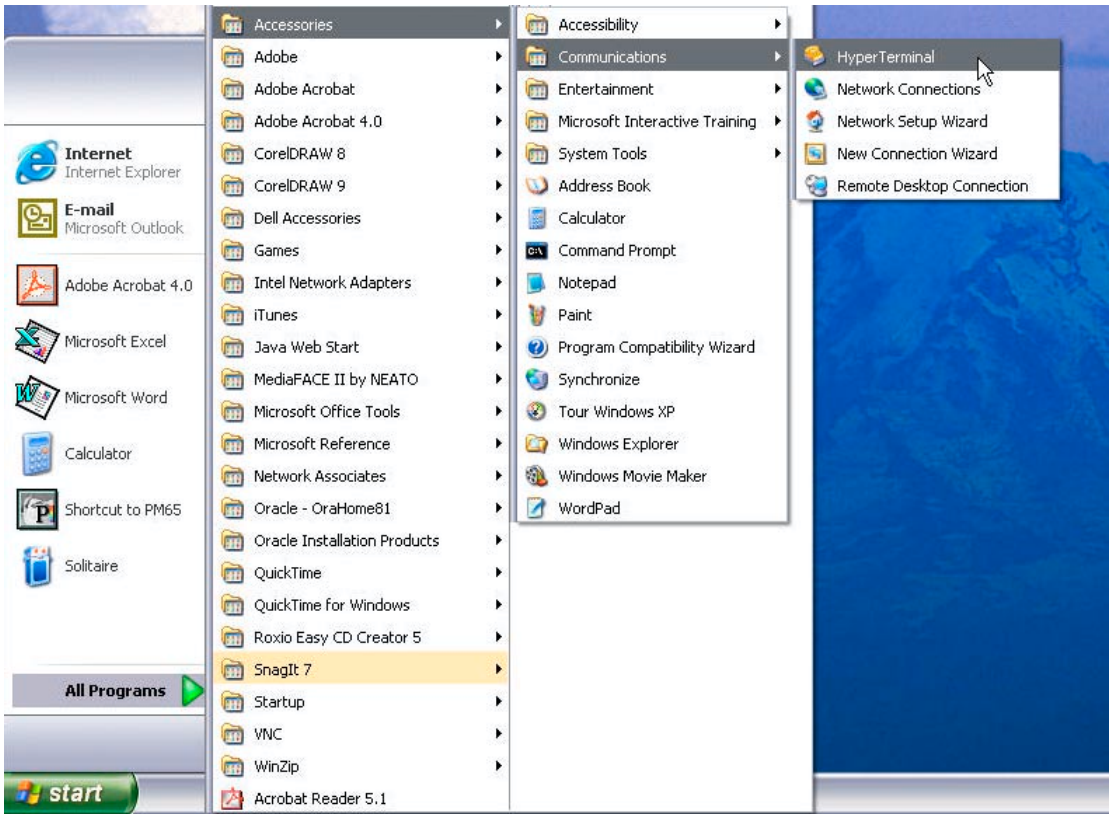
WARNING

Do not attempt to update the firmware on a DPC 4 *Plus*. They have the latest version.

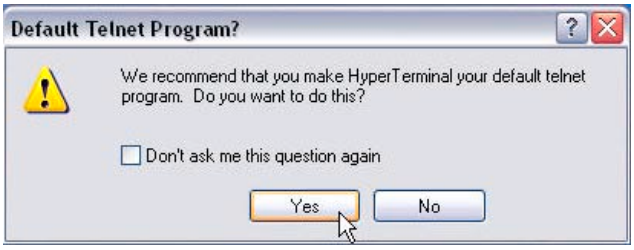
Do not try and turn a DPC 4 into a DPC 4 *Plus*. Attempting to rewrite the Flash Memory on a DPC 4 with the 4 Plus software will erase the entire DPC IV Flash Memory, leaving it in a coma!



3. To rewrite the DPC IV Flash memory, you will use a Windows utility called HyperTerminal. Click on the **Start->All Programs** button and navigate to the **HyperTerminal** directory.

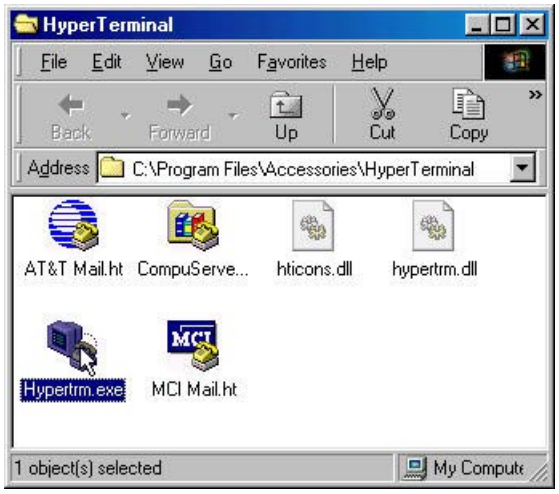


If a window appears asking if you want to make Hyperterminal your default Telenet program, click the Yes button.

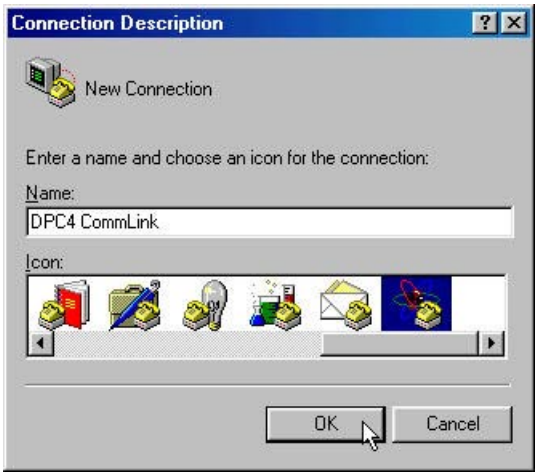

Default Telnet Program?
We recommend that you make HyperTerminal your default telnet program. Do you want to do this?
Don't ask me this question again
Yes
No

4. A new window for the **HyperTerminal** directory will open. Double–click on the **Hypertrm.exe** application to open a new dialog window.

NOTE —
Your **HyperTerminal** directory may be located in the **Accessories** folder instead of the **Communications** folder. If it is not installed, you can go back to your original Windows™ installation CD and perform a custom installation of just the HyperTerminal program.



5. Enter a name for the connection description, file select an icon of your choice and click **OK**. Choose any name you want.



6. Select the **Direct to COM1** (or **COM2**) connection and click **OK** again.

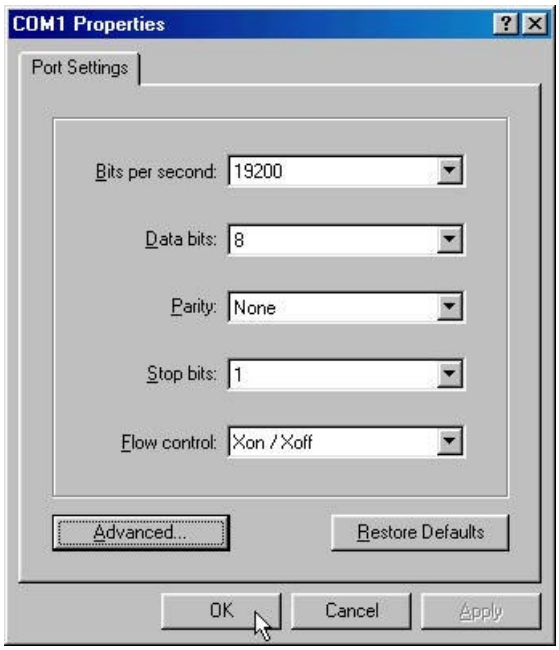
CAUTION

Call the Service Department first to check if there have been any recent changes to this procedure.

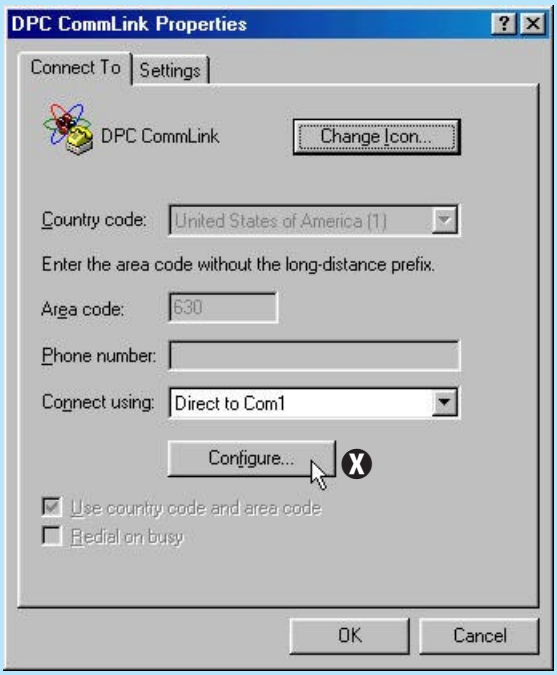
Schedule a DPC firmware update early in the week and early in the day. While every precaution has been taken to ensure the Flash Memory writing is trouble–free, Murphy's Law will almost certainly apply if you wait until late Friday afternoon.

DISCLAIMER —
While iPC and Flash Memory updates are normally performed without incident, unforeseeable problems may sometimes occur and therefore should be performed during a period of inactivity. Dukane is not responsible for lost production, etc. due to failed upgrades.

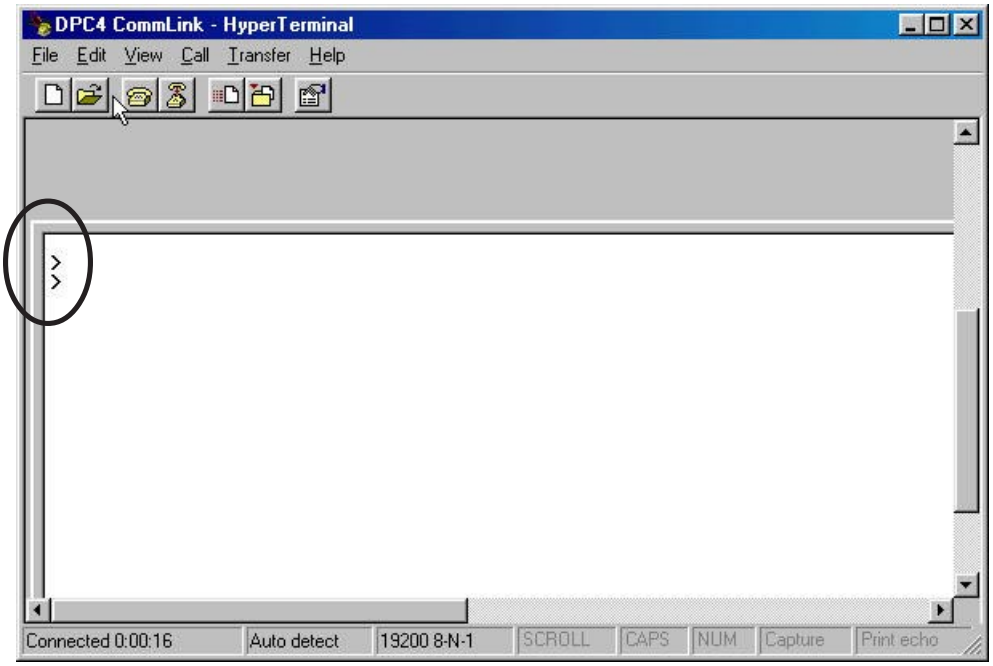
7. Enter the same port settings as we used in Section 3. Click **OK** when you are finished.



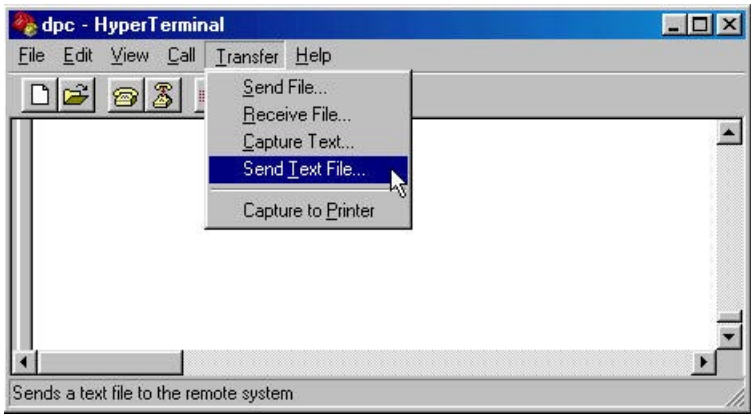
TIP —
You can always double check your settings or change the icon by choosing **File > Properties** then click on the **Configure** button Ⓧ.



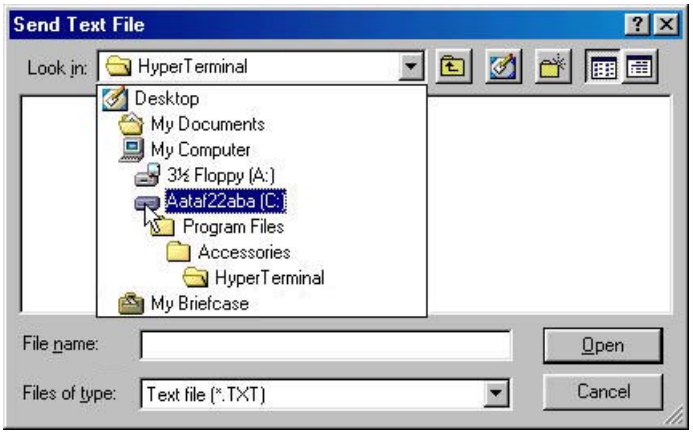
8. A terminal HyperTerminal window opens with the name of the connection description file in the window title bar. Press the enter key a few times. The DPC should echo back with a carat (i.e. the greater–than sign; the same as a DOS session prompt). If the DPC does not echo back, check the DPC port settings and the serial cable connection.



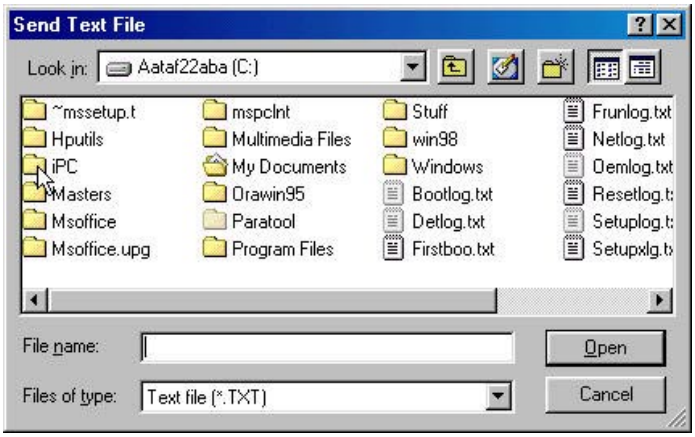
9. We are now ready to update the DPC firmware. Click on the **Transfer** menu and select **Send Text File...** as shown.



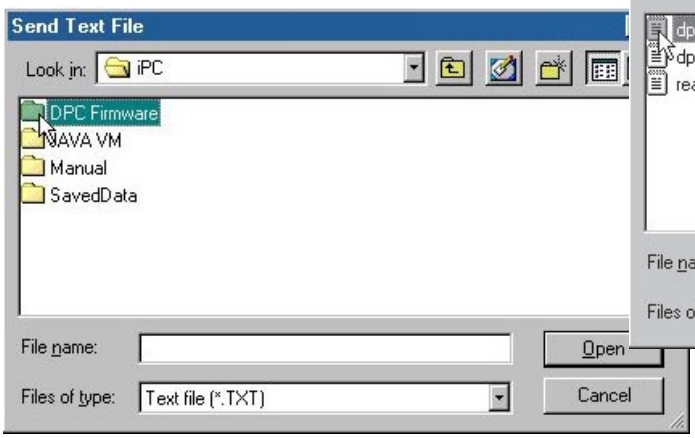
10. By default, the window opens in the **HyperTerminal** directory. Click the triangle at the right of the **Look In:** menu bar.

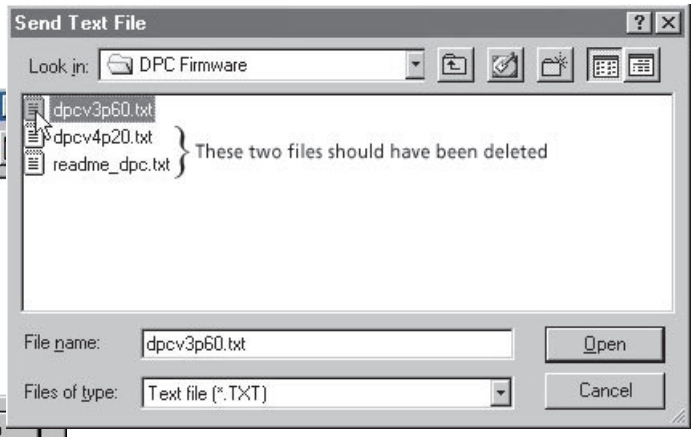


11. Navigate up to the root **C:** directory (or wherever you installed the iPC) till you locate the iPC folder.



12. Now select the iPC folder and click open, then open the **DPC Firmware** folder.
13. Select the **dpcv3p60.txt** file and click the Open button.

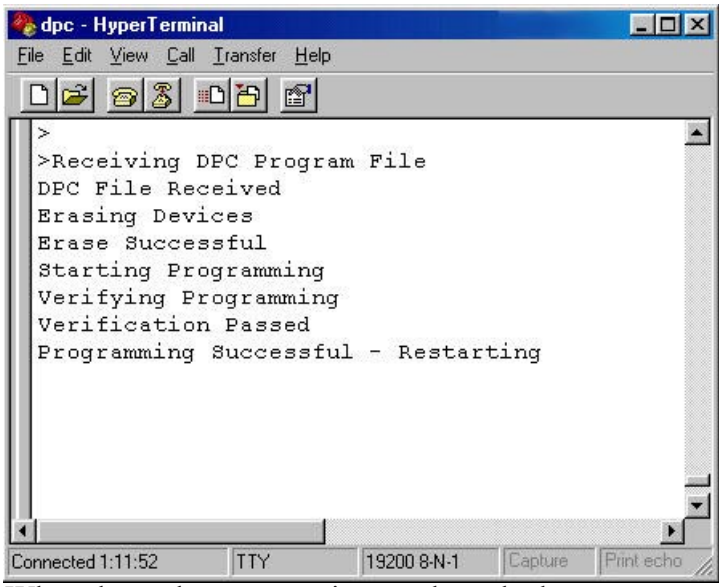




14. Now your **HyperTerminal** window will begin displaying the status of the firmware update process. This can require up to 20 minutes to complete. At this point the DPC communication link is vulnerable. Do not turn off the DPC power or disconnect the serial data cable. Doing this may leave the DPC unable to communicate via its serial port.

WARNING

DO NOT disrupt the communication link to the DPC or turn the DPC power off during the firmware update process



15. When the update process is complete, the last line of the status message reads:
    `Programming Successful - Restarting`
    At this point you may exit the **HyperTerminal** program and proceed to launch iPC v1.7.

NOTE —
DPC IV Firmware is stored in four Flash Memory chips. The DPC startup files are stored in a separate EEPROM chip. They are independent and retain their information when the power is turned off.

Possible Problems

Invalid Checksum

Every line in a DPC program file has a checksum. A checksum is a byte used to ensure each line is sent without errors. If an `Invalid Checksum` message is displayed after the `DPC File Received` message, stop the file transfer and try again. To stop the file transfer, from the menu bar select **Call > Disconnect** or click on the **Disconnect** icon (fourth from left under the **Call** menu).

The program file contains blank lines at the beginning to clear the DPC buffer. It is possible to see an `Invalid Checksum` message at the start of the transfer as long as this happens before the `DPC File Received` message.

Erase Failed

One or more devices failed to erase. Replacement program Flash Memory devices are required from the Dukane Ultrasonics Service Department.

Write Failure

One or more devices could not be written to. Replacement program Flash Memory devices are required from the Dukane Ultrasonics Service Department.

WARNING

DO NOT turn off the DPC AC power to stop the file transfer. Doing this may leave the DPC unable to communicate via its serial port.

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Starting *iPC*™

- Launching iPC
- Performance Comparison

Launching *iPC*™ Software 71
Performance Comparison 72
Status Bar 73

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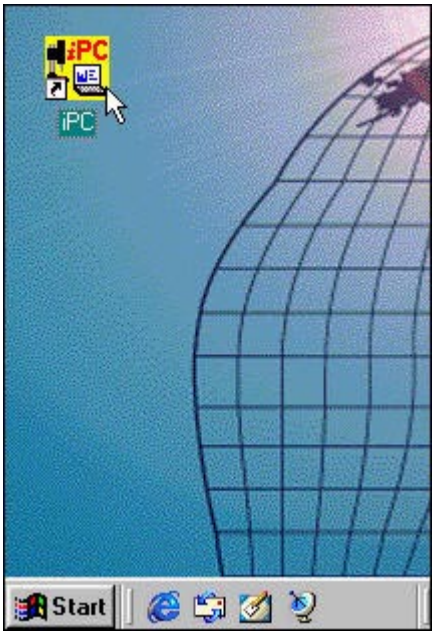
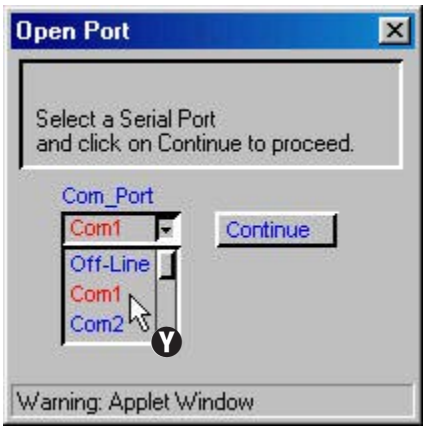
Launching *iPC* Software

A shortcut icon was placed on the Windows desktop during the iPC installation. Double click the iPC icon to launch the program.



Internet Explorer launches and displays an iPC splash screen. A few seconds later, a small window titled **Open Port** appears in the center of the screen. If the DPC is not turned on, turn it on now and wait for it to complete its powerup self–check. Now select the COM port ❻ you previously configured (**COM1 or COM2**) and click **Continue**.



NOTE

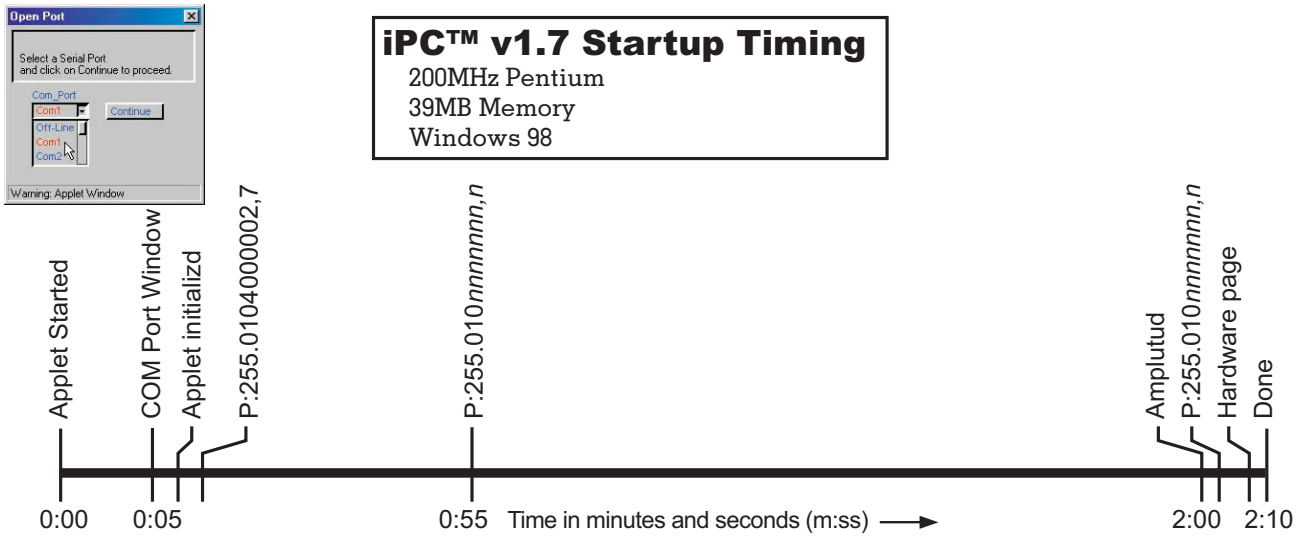
The iPC will not work with the Netscape Navigator browser. If Netscape launches instead of Explorer, follow the instructions under **Associating IE5 With iPC Program** in Section 10 to change the file association type.

NOTE —
Select **Off-Line** if the DPC is not connected by the serial cable or needs to be turned off. If **Com1** or **Com2** is selected and the DPC is not turned on and/or not connected to the PC via the serial cable, the iPC software will stop loading and will wait (forever) for a response from the DPC.

Once the DPC is turned on, the iPC software will recognize the DPC connection, and finish loading.

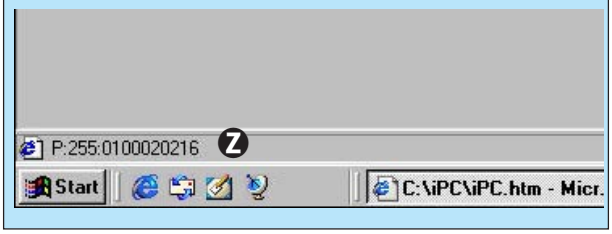
Performance Comparison

The chart below gives the timing of the iPC loading status. These measurements were taken on a PC configured with the minimum requirements.



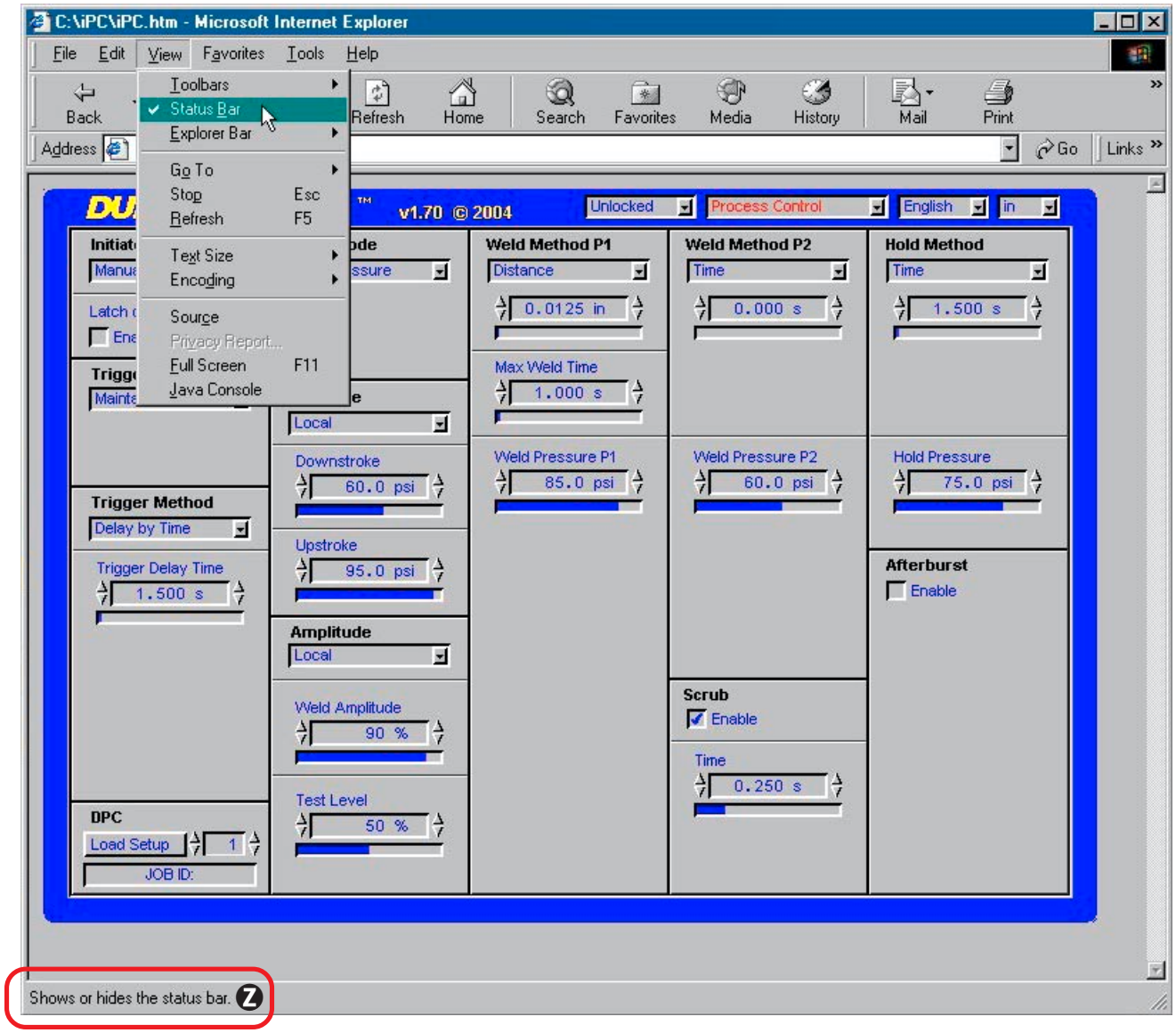
Using a faster computer shortens both the time to download the DPC settings and configure the program and results in much better performance.

NOTE —
The status bar in the lower left–hand corner Ⓩ of the IE window gives an indication of the progress of the iPC startup and corresponds to the labels on the time lines.



Status Bar

If you do not see the Status Bar ❷ at the bottom of the window, enable it from the View menu (check mark showing) as shown below.



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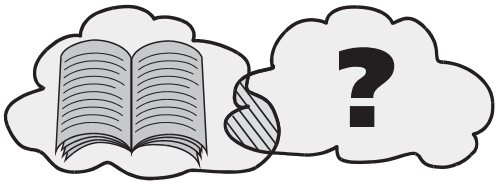
SECTION 10

Help & Troubleshooting



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Associating IE With iPC Program 81

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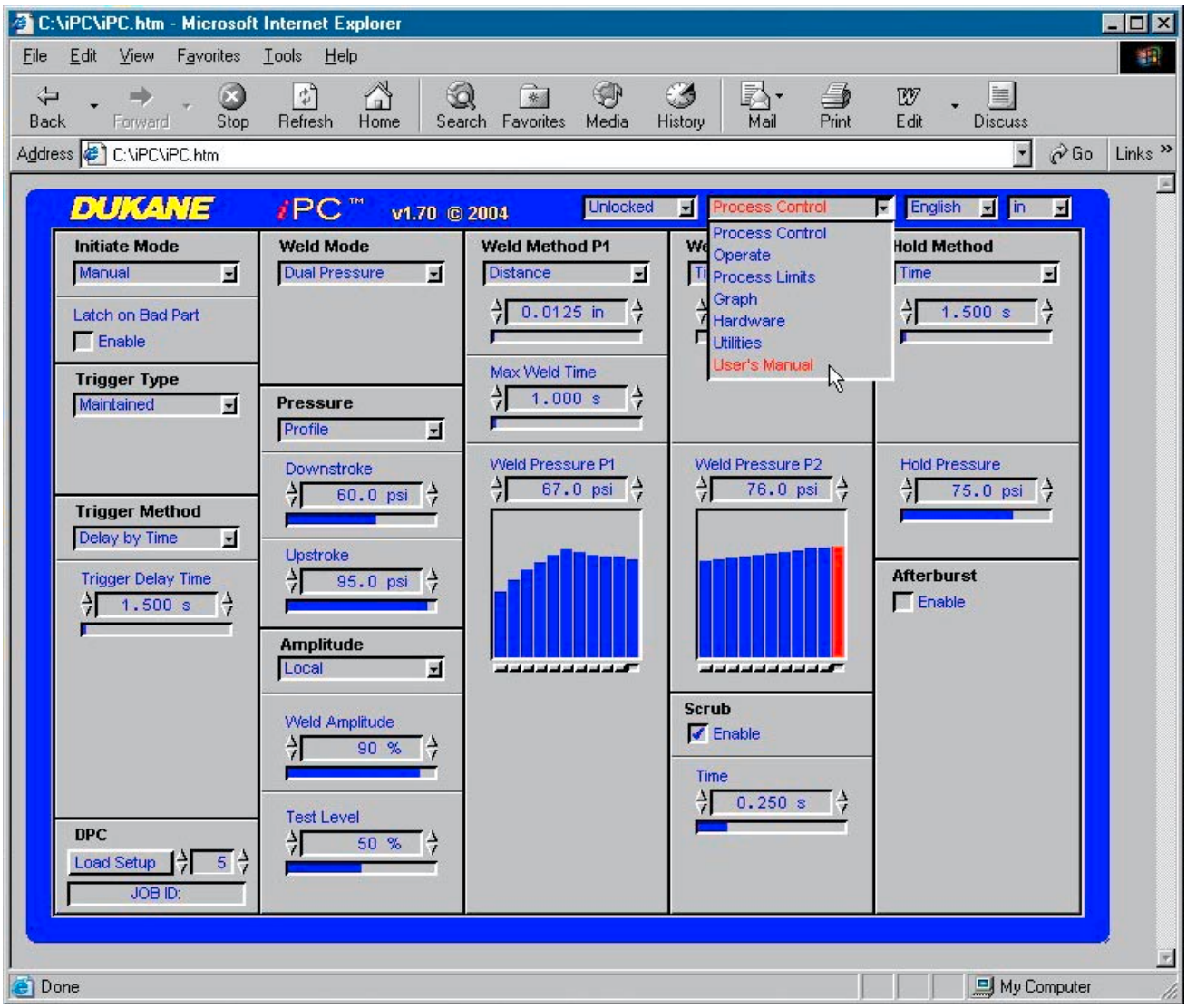
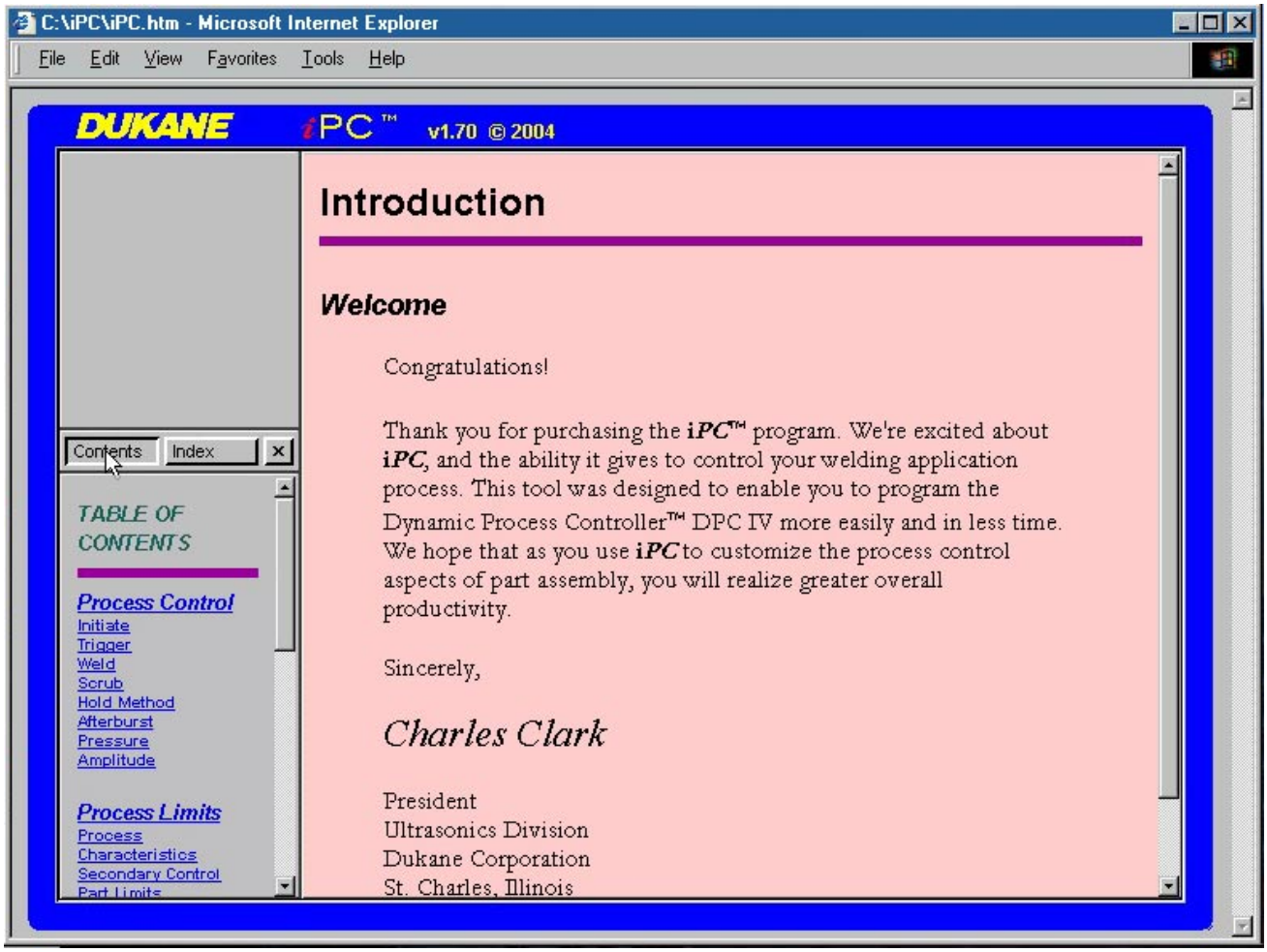
Context–Sensitive Help

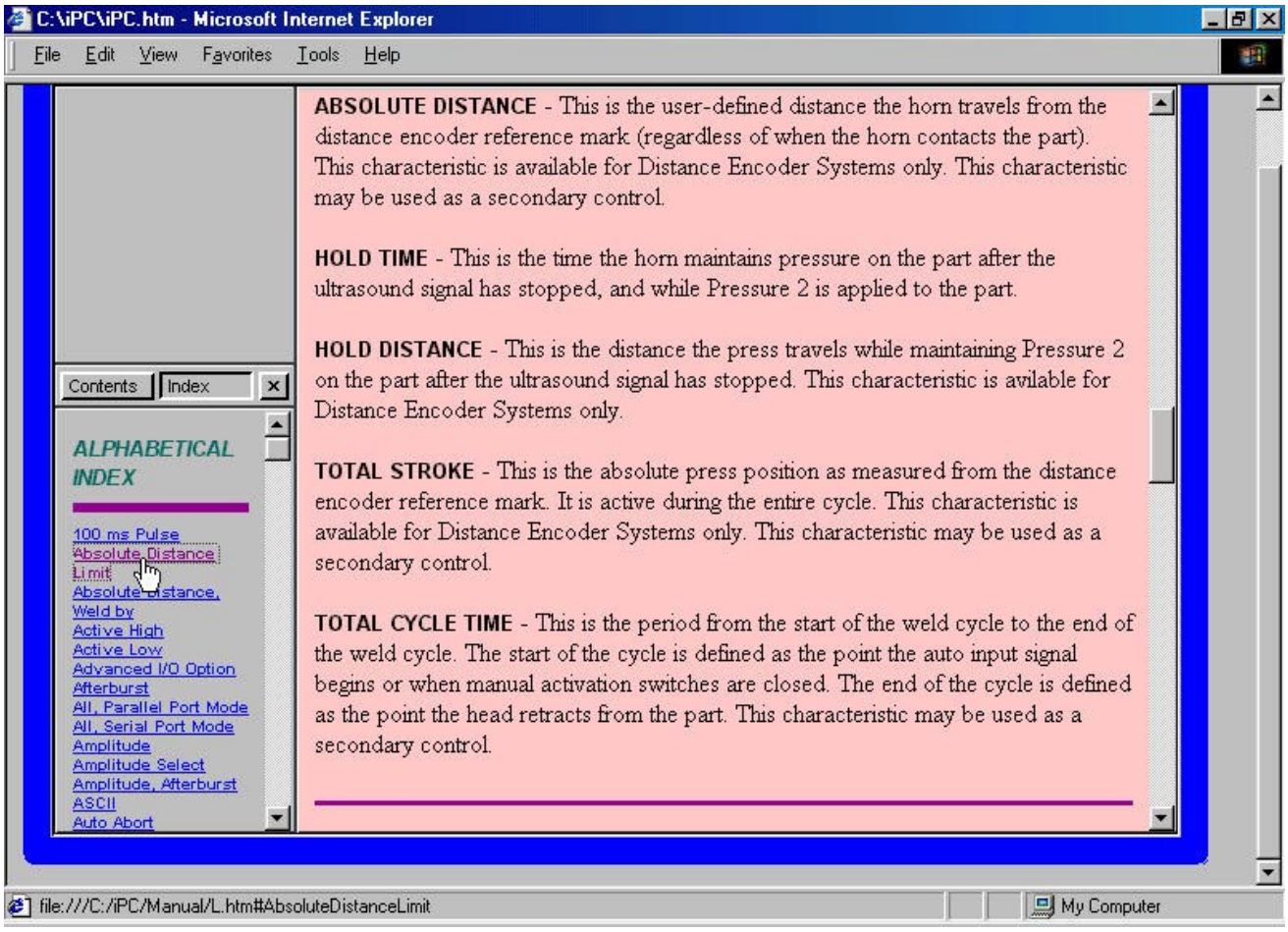
iPC has a built–in help file to assist you with routine questions. To access the help system, select **User's Manual** in the iPC menu selection box as shown below.



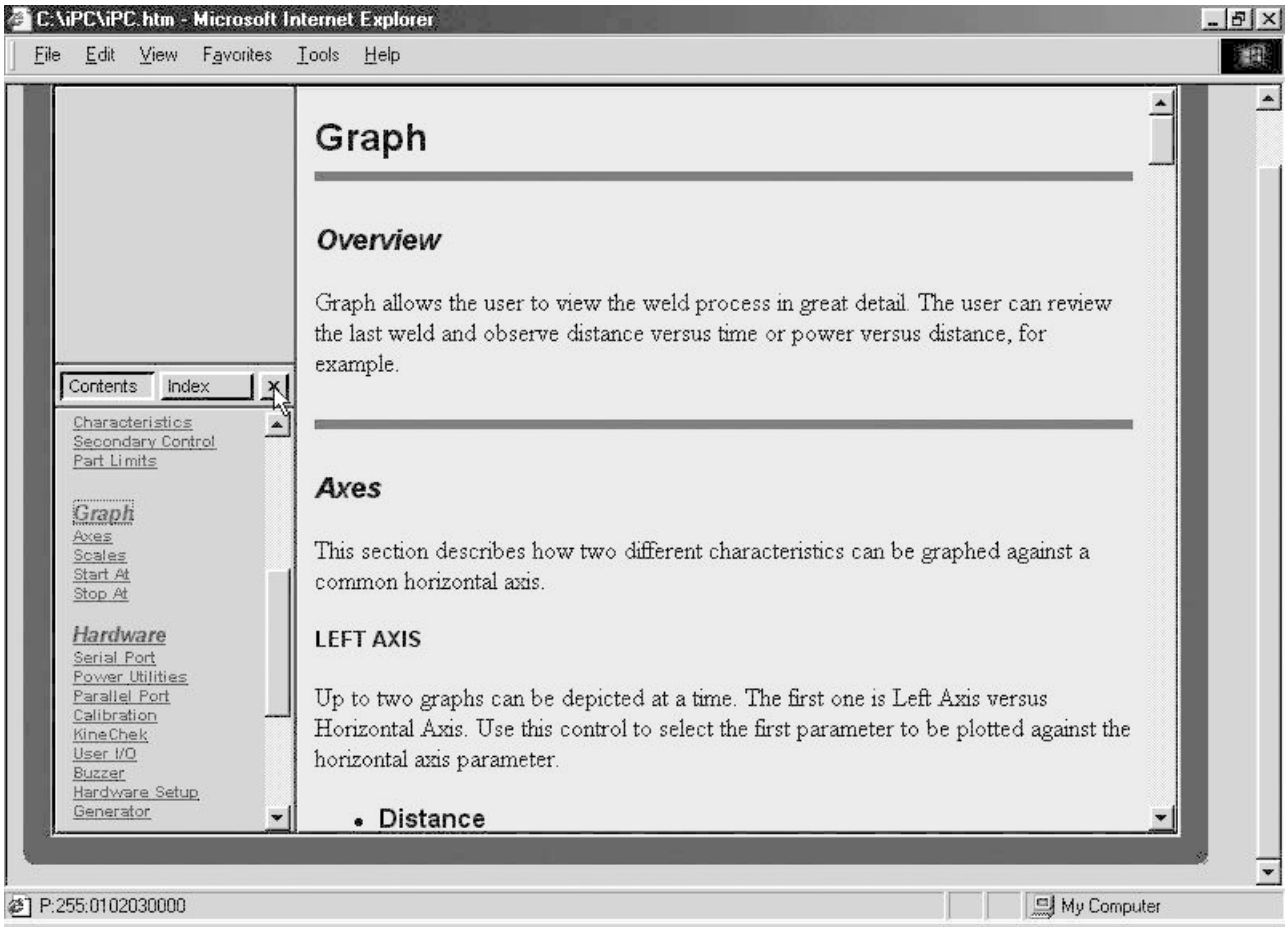
The window will refresh and the User's Manual splash screen appears. By default it opens with the **Table of Contents** displayed in the left panel.


C:\iPC\iPC.htm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
DUKANE iPC™ v1.70 © 2004
Introduction
Welcome
Congratulations!
Thank you for purchasing the iPC™ program. We're excited about iPC, and the ability it gives to control your welding application process. This tool was designed to enable you to program the Dynamic Process Controller™ DPC IV more easily and in less time. We hope that as you use iPC to customize the process control aspects of part assembly, you will realize greater overall productivity.
Sincerely,
Charles Clark
President
Ultrasonics Division
Dukane Corporation
St. Charles, Illinois
Contents
Index
TABLE OF CONTENTS
Process Control
Initiate
Trigger
Weld
Scrub
Hold Method
Afterburst
Pressure
Amplitude
Process Limits
Process Characteristics
Secondary Control
Part Limits

To look up a specific topic, move the cursor over the topic. The cursor turns into a hand with a pointing finger. Click on the topic you want more information about. You can also view the topics in alphabetical order by clicking on the **Index** button.

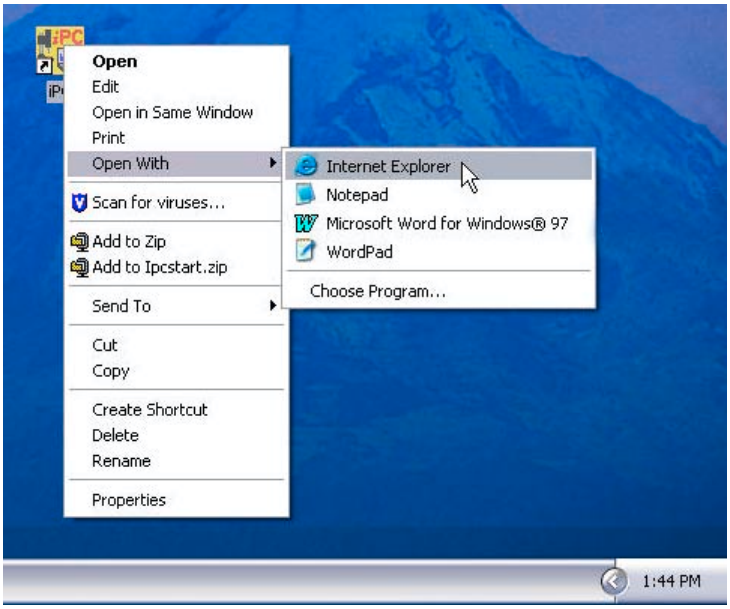

C:\iPC\iPC.htm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Contents Index
ALPHABETICAL INDEX
100 ms Pulse
Absolute Distance Limit
Absolute Distance, Weld by
Active High
Active Low
Advanced I/O Option
Afterburst
All, Parallel Port Mode
All, Serial Port Mode
Amplitude
Amplitude Select
Amplitude, Afterburst
ASCII
Auto Abort
ABSOLUTE DISTANCE - This is the user-defined distance the horn travels from the distance encoder reference mark (regardless of when the horn contacts the part). This characteristic is available for Distance Encoder Systems only. This characteristic may be used as a secondary control.
HOLD TIME - This is the time the horn maintains pressure on the part after the ultrasound signal has stopped, and while Pressure 2 is applied to the part.
HOLD DISTANCE - This is the distance the press travels while maintaining Pressure 2 on the part after the ultrasound signal has stopped. This characteristic is avilable for Distance Encoder Systems only.
TOTAL STROKE - This is the absolute press position as measured from the distance encoder reference mark. It is active during the entire cycle. This characteristic is available for Distance Encoder Systems only. This characteristic may be used as a secondary control.
TOTAL CYCLE TIME - This is the period from the start of the weld cycle to the end of the weld cycle. The start of the cycle is defined as the point the auto input signal begins or when manual activation switches are closed. The end of the cycle is defined as the point the head retracts from the part. This characteristic may be used as a secondary control.
file:///C:/iPC/Manual/L.htm#AbsoluteDistanceLimit
My Computer

To return to the **Process Control** page, click the close box next to the Index button. if you click the close box in the upper right–hand corner, you will exit the iPC.

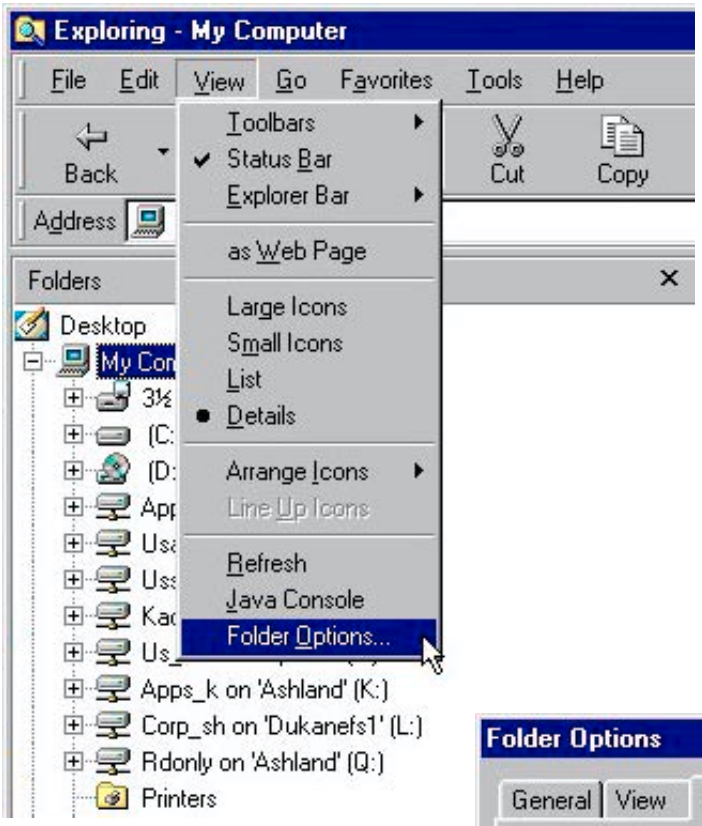

C:\iPC\iPC.htm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Graph
Overview
Graph allows the user to view the weld process in great detail. The user can review the last weld and observe distance versus time or power versus distance, for example.
Contents
Index
Characteristics
Secondary Control
Part Limits
Graph
Axes
Scales
Start At
Stop At
Hardware
Serial Port
Power Utilities
Parallel Port
Calibration
KineChek
User I/O
Buzzer
Hardware Setup
Generator
Axes
This section describes how two different characteristics can be graphed against a common horizontal axis.
LEFT AXIS
Up to two graphs can be depicted at a time. The first one is Left Axis versus Horizontal Axis. Use this control to select the first parameter to be plotted against the horizontal axis parameter.
Distance
P:255:0102030000
My Computer

Associating IE With iPC Program

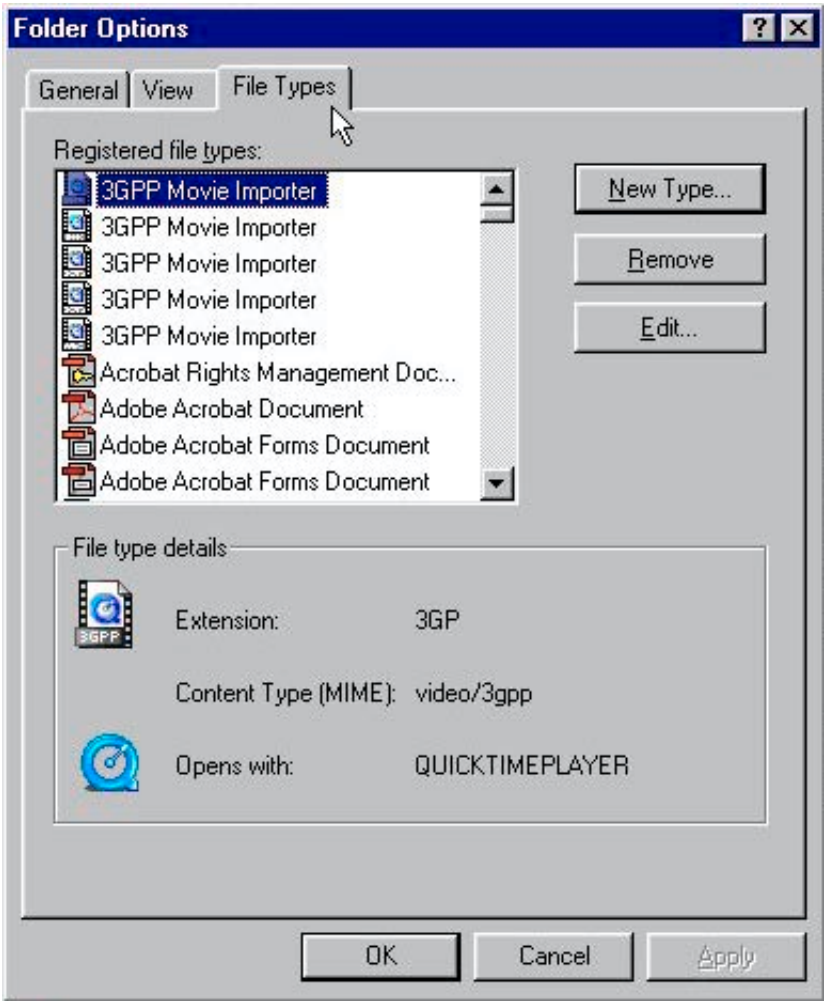
If you also have Netscape Navigator installed, you may find that the iPC software launches Navigator instead of Internet Explorer. Even though the iPC can run under a variety of Windows versions, iPC is tailored specifically for the Internet Explorer browser. The method for setting which application is launched differs between different version of Windows. Since there isn't one universal set of instructions for setting which program is launched when you open a file, the best way is to modify iPC.



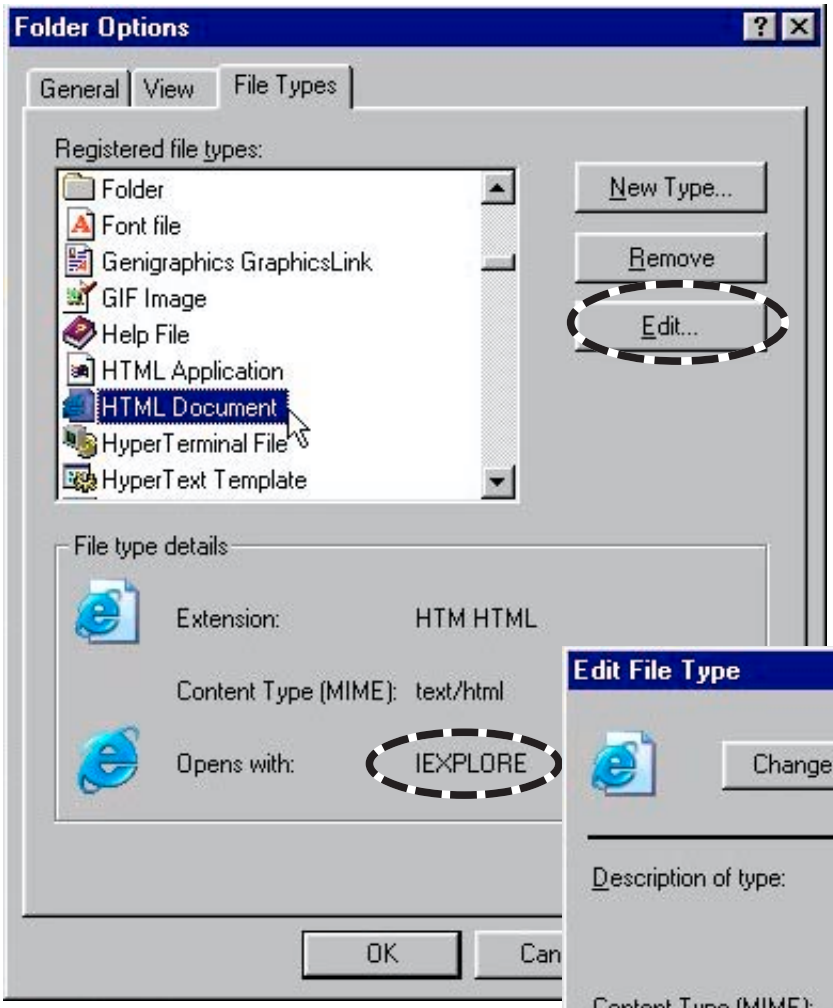
If iPC starts an internet browser other than **Internet Explorer**, close the program. In Windows XP, right click on the iPC icon and select **Open With**. Select the target as **Internet Explorer**. This method will not permanently change the iPC to open with Internet Explorer. It must be used each time you start iPC. To make a permanent change, select **My Computer** in the Windows Explorer screen. Select **Folder Options** from the **View** menu as shown in the screen shot on the next page.



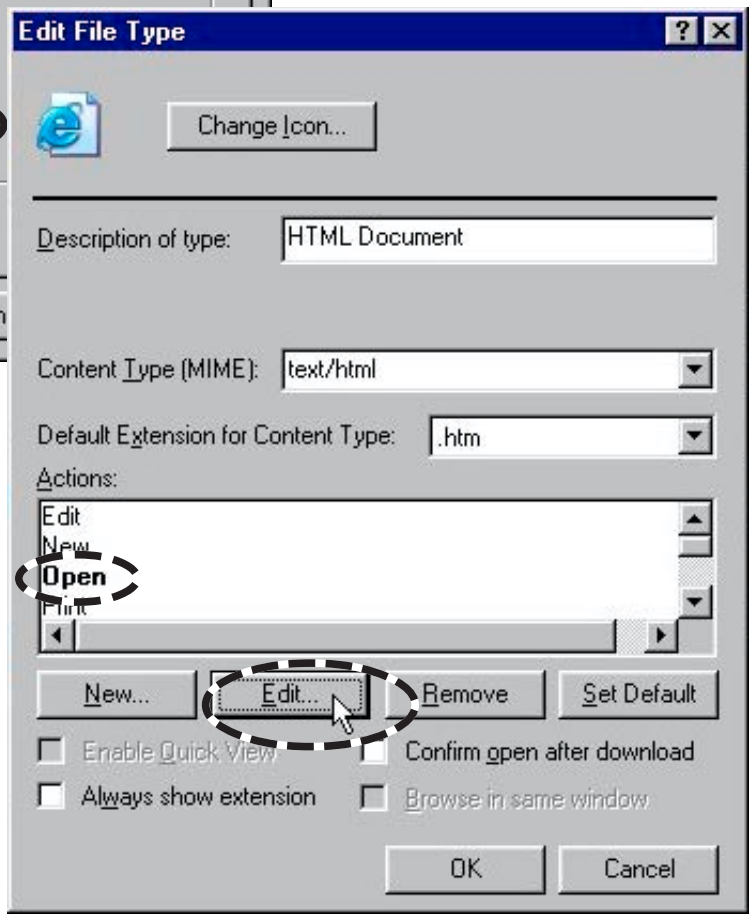
In the **Folder Options** window, select the **File Types** tab as shown.

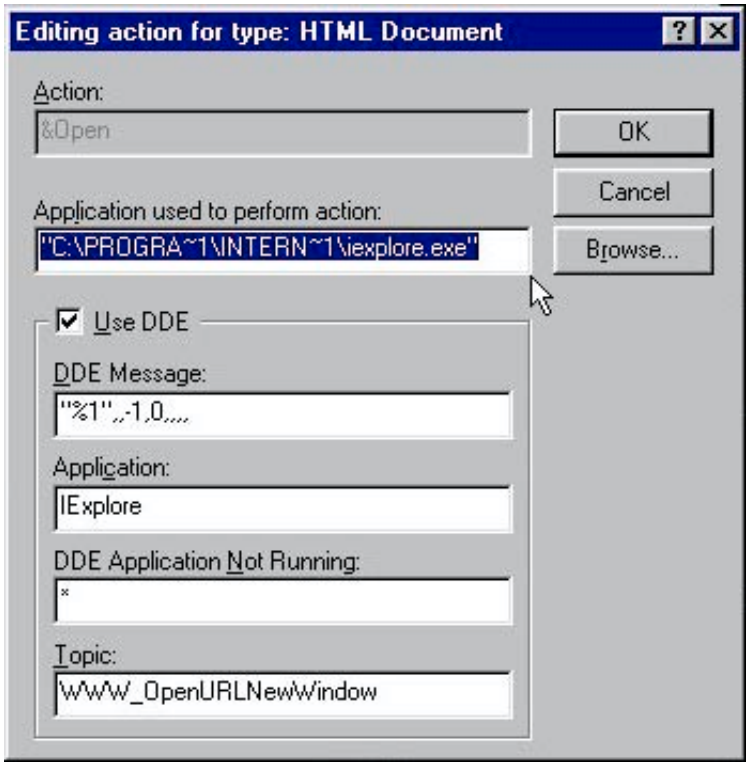


Scroll down until **HTML Document** is shown. If **IEXPLORE** is not listed as the program to open the file, click the **Edit...** button to change the program.



In the new window (shown at right), select **Open** and then **Edit...**, or just double–click on the **Open** action in the selection window to locate the target program. A new window opens as shown on the next page.





Internet Explorer is usually located along a path something like: `C:\Program Files\Internet Explorer\Iexplore.exe` Use the **Browse** button to locate IE5 and then press the **OK** button to complete. Close any other open windows. Now double–click on the iPC icon and it should launch Internet Explorer.

SECTION 11

Contacting Dukane

- Corporate Office
- Extensions & eMails

Local Support 87
Ultrasonics Division 87
Telephone Numbers 87
eMail Addresses 87
Our Website 87

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Contacting Dukane

Identify Equipment

When contacting Dukane, especially if calling about a service-related problem, be prepared to give the iPC version number and serial number.

Local Support

Your local Dukane representative has received factory training and can answer all of your questions regarding Dukane equipment.

Ultrasonics Division

Mailing Address:	Dukane Ultrasonics
2900 Dukane Drive	St. Charles, IL 60174 USA
Main Phone:	(630) 797–4900
Main Fax:	(630) 797–4949
Service & Parts Fax:	(630) 584–0796

Department Phone Numbers

You can reach each department by dialing directly

Application Support (630) 797–4930
For applications and/or process technology questions.

Engineering (630) 797–4950
For engineering of standard and customized systems.

Service & Parts (630) 762–4090
For equipment servicing or replacement parts.

Department email Addresses

Applications: ..... usapps@dukcorp.com

Engineering: ..... useng@dukcorp.com

Service & Parts: ..... usservice@dukcorp.com

Our Website

Dukane Corporation is on the worldwide web at:

http://www.dukcorp.com

Navigate to the Ultrasonics site, or enter:

http://www.dukcorp.com/us

and then go to your area of interest.

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Appendix A

Data File Format

P, 13:46:14, 003, 01, 0, 4, 100, 24, 030, 0.250, 032, 0.10, 033, 0.2
250, 9, 0.500, 0.000, s, 4, 51000, 49000, Hz
57, 57, 57, 57, 88, 88, 88, 88, 156, 156, 156, 156, 156, 158, 158, 158
158, 158, 158 ,158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158
158, 158, 158 ,158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158
158, 158, 158 ,158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158
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158, 158, 158 ,158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158
158, 158, 158 ,158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158, 158

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Welding Parameter 92
Graph Parameter 93
Graph Data Values 93

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Creating A Data File

When the check box for **Save Graph Data + Parameters Automatically** is enabled (see screen shot below), iPC creates a csv–type text data file in the folder named `C:\iPC\Saved Data`. This folder should not be renamed or removed. The file is named `YYYYMMDD.csv` where YYYY represents the year, MM the month and DD the day. The file contains at least 3 lines for each part. The first line is the part welding parameters, the second line is the graph parameters and the third line is the graph data. If the right axis is defined on the graph, the forth and fifth lines are the right hand graph parameters and data.

Microsoft Excel - 20030731

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
3		Number of Graph Data Points	Code or Horizontal Axis Data Type Code	Maximum Graph Limit Horizontal	Maximum Graph Limit Horizontal	Horizontal Axis Data Type	Code or Vertical Axis Data Type Code	Maximum Graph Limit Vertical	Minimum Graph Limit Vertical	Vertical Axis Data Type	Parameter	Code	Units	
4											Distance	0	in / mm	
5											Velocity	1	in/s mm/s	
6											Power	2	J	
7											Energy	3	W	
8											Frequency	4	Hz	
9											Force	5	lbs / N	
10											Pressure	6	psi / KPa	
											Amplitude	7	in / Mm	
											Time	9	Sec	
	Part Data Cycle #1	P	8:21:56	1	1	0	5	100	1	30	1	32	79.71	33
	Graph Limits - Power	250	9	1	0	s	2	250	0	Watts				
	Graph Data Cycle #1	0	0	2	6	12	15	17	22	32	41	46	54	66
	Graph Limits - Energy	250	9	1	0	s	3	80	0	J				
	Graph Data Cycle #1	0	0	0	0	0	0	0	0	1	1	2	2	3
	Part Data Cycle #2	P	8:23:44	1	1	0	7	100	1	30	1	32	79.79	33
	Graph Limits - Power	250	9	1	0	s	2	250	0	Watts				
11	Graph Data Cycle #2	0	0	2	6	12	15	18	22	32	40	46	54	66
12	Graph Limits - Energy	250	9	1	0	s	3	80	0	J				
13	Graph Data Cycle #2	0	0	0	0	0	0	0	0	1	1	2	2	3
14		P	8:23:53	1	1	0	7	100	2	30	1	32	79.66	33
15		250	9	1	0	s	2	250	0	Watts				
16		0	0	1	5	10	14	17	21	30	39	44	51	63

Welding Parameters

The first line of the welding parameter header starts with the letter P as is shown in column B in the screen shot . The remainding colums in the first row provide the welding parameter information as defined by:

`P,HH:MM:SS,XXX,SS,U,N,YZZ, VVVVVVVVVVV[ ,YZZ, VVVVVVVVVVV]…….<CR>[ <LF>]`

Where:

`P`	The letter "P" is a marker for a new part
`HH:MM:SS`	Time of the day, in 24-hour format (i. e. 14:10:00 is 2:10:00 PM)
`XXX`	Three digit node number
`SS`	Two digit setup number
`V`	Units (0 = US, 1 = Metric)
`N`	Number of parameters

And for each parameter:

`YZZ`	The parameter's 3-digit code; includes: Status of the characteristic; status of the part if associated with part count (00): 1 = good, 2 = suspect low, 3 = suspect high, 4 = bad low, 5 = bad high; ZZ: the characteristic number (see table below) and
VVVVVVVVVVV	The parameter's value.

Welding Parameter	Code Number	Units (US)	Units (Metric)
Parts Counter	00	-	-
Line Pressure	01	psi	kPa
Downstroke Time	10	sec	sec
Downstroke Distance	11	in	mm
Downstroke Velocity	12	in/s	mm/s
Contact Pressure	13	psi	kPa
Trigger Delay Time	20	sec	sec
Trigger Delay Distance	21	in	mm
Weld Time P1	30	sec	sec
Weld Distance P1	31	in	mm
Weld Energy P1	32	j	j
Weld Power P1	33	w	w
Weld Time P2	40	sec	sec
Weld Distance P2	41	in	mm
Weld Energy P2	42	j	j
Weld Power P2	43	w	w
Absolute Weld Distance	50	in	mm
Total Weld Time	51	sec	sec
Total Weld Distance	52	In	mm
Total Weld Energy	53	j	j
Hold Time	60	sec	sec
Hold Distance	61	in	mm
Total Cycle Time	70	sec	sec
Total Stroke	71	in	mm

NOTE

This information is also included on the CD. The file is a WORD™ document named —

`What's New in v1.7x.doc`

Also read the files —

`Final Release Notes for iPC1.7x.doc`
`iPC Installation Guide.doc`

Graph Parameters

The second line of the data file defines the graph parameters for the left vertical and bottom horizontal axes. If a second graph is defined, the fourth line of the data file lists the parameters for the right vertical and bottom horizontal axes. The first value is a number that indicates the number of data points. The graph format string has the following format:

`PPP,H,AAAAAAAAA,BBBBBBBBB,CCCCCCC,V,DDDDDDDDD,EEEEEEEEE,FFFFFFF`

Where:

`PPP`	Number of Data Points (250 default)
`H`	Horizontal Data Type
`AAAAAAAAA`	Horizontal Axis Max Value
`BBBBBBBBB`	Horizontal Axis Min Value
`CCCCCCC`	Horizontal Units Name (text)
`V`	Vertical Data Type
`DDDDDDDDD`	Vertical Axis Max Value
`EEEEEEEEE`	Vertical Axis Min Value
`FFFFFFF`	Vertical Units Name (text)

Graph Parameter	Code Number	Units (US)	Units (Metric)
Distance	0	in	mm
Velocity	1	in/s	mm/s
Power	2	J	J
Energy	3	W	W
Frequency	4	Hz	Hz
Force	5	lbs	N
Pressure	6	psi	KPa
Amplitude	7	in	mm
Time	9	Sec	Sec

Graph Data

The third (and fifth if a second graph is present) line of the file are the data for the weld cycle graph. The data can be reconstructed into a graph using the graph parameters to scale the left vertical and bottom horizontal axes. The horizontal axis ranges from the minimum value to the maximum in equally spaced values (H_i) determined by the formula:

$H_G = (AAAAAAAAA - BBBBBBBBB)/PPP$

where AAAAAAAAA = Horiz Axis Max Value
BBBBBBBBB = Horiz Axis Min Value
PPP = Number of Data Points (250 by default)

Each horizontal–axis data point has the value:
$H_i = (i \times \mathfrak{H}_G) + BBBBBBBBB$
where i = Data Point Number – 1 and
$\mathfrak{H}_G$ = horizontal axis increment

The vertical axis ranges from the minimum value to the maximum in equally spaced values (V_i) determined by the formula:
$\mathfrak{V}_G = (DDDDDDDDD – EEEEEEEEE)/250$
where DDDDDDDDD = Vert Axis Max Value
EEEEEEEEE = Vert Axis Min Value

Each vertical–axis data point has the value:
$V_i = (i \times \mathfrak{V}_G) + EEEEEEEEE$
where i = Data Point Number – 1 and
$\mathfrak{V}_G$= vertical axis increment

As an example, lets consider the following three lines from a data file:

```
P,13:46:14,003,01,0,4,100,24,030,0.250,032,0.10,033,0.2
250,9,0.500,0.000,s,4,51000,49000,Hz
57,57,57,57,88,88,88,88,156,156,156,156,158,158,158,…
```

Header string (1st line)

P	Start of part marker
Time	13:46:14 (1:46 pm)
Node ID	003
Setup number	01
Units	0 (US)
Num. Params	4
Part Status	100 (1=Good Part, 00=Parts Counter)
Number of Parts	24
Weld Time P1 (030)	0.250 sec
Weld Energy P1 (032)	0.10 Joule
Weld Power P1 (033)	0.2 Watt

Graph Parameter string (2nd line)

Number of Data Points	250
Horizontal Data Type	9 (Time)
Horizontal Axis Max Value:	0.500 sec
Horizontal Axis Min Value:	0.000 sec
Horizontal Units Name:	s (seconds)
Vertical Data Type:	4 (Frequency)
Vertical Axis Max Value:	51000
Vertical Axis Min Value:	49000

To reconstruct the data, we need to know the offset, range and scale factors. The horizontal axis increment is just the (Max – Min)/250.

$\mathfrak{H}_G$ = (0.5 sec – 0.0 sec)/250 = 0.002 second

The vertical data must be scaled and given the correct offset.

$\mathfrak{V}_G$ = (51000 Hz –49000 Hz)/250 = 8 Hz

for the first data point), i = 0, so

$H_0 = (i \times \mathfrak{H}_G) + 0 = = (0 \times 0.002) + 0 = 0.000$ sec

$V_0 = (i \times \mathfrak{V}_G) + 0 = = (57 \times 8) + 49000 = 49456$ Hz

Vertical Units Name: Hz

Data values (3rd line)

The first fifteen points then look like:

Point Number	*i*	Raw Data	Time (sec)	Freq (Hz)
1	0	57	0.000	49456
2	1	57	0.002	49456
3	2	57	0.004	49456
4	3	57	0.006	49456
5	4	88	0.008	49704
6	5	88	0.010	49704
7	6	88	0.012	49704
8	7	88	0.014	49704
9	8	156	0.016	50248
10	9	156	0.018	50248
11	10	156	0.020	50248
12	11	156	0.022	50248
13	12	158	0.024	50264
14	13	158	0.026	50264
15	14	158	0.028	50264

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Dukane ISO

ISO CERTIFICATION

Dukane chose to become ISO 9001:2000 certified in order to demonstrate to our customers our continuing commitment to being a quality vendor. By passing its audit, Dukane can assure you that we have in place a well–defined and systematic approach to quality design, manufacturing, delivery and service. This certificate reinforces Dukane's status as a quality vendor of technology and products.

To achieve ISO 9001:2000 certification, you must prove to one of the quality system registrar groups that you meet three requirements:

1. Leadership
2. Involvement
3. Quality in Line Organizations and Quality System Infrastructure.

The ISO 9001:2000 standard establishes a minimum requirement for these requirements and starts transitioning the company from a traditional inspection–oriented quality system to one based on partnership for continuous improvement. This concept is key in that Dukane no longer focuses on inspection, but on individual processes.

Dukane's quality management system is based on the following three objectives:

1. Customer oriented quality. The aim is to improve customer satisfaction.
2. Quality is determined by people. The aim is to improve the internal organization and cooperation between staff members.
3. Quality is a continuous improvement. The aim is to continuously improve the internal organization and the competitive position.

ISO 9001:2000
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Dukane products are manufactured in ISO registered facilities

DUKANE CORPORATION

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We are plastic welding technologists. We are scientists.
We are employees and businessmen. We are instructors.
We are engineers. We are specialists in electronics
and experts in plastic assembly. We are salesmen. We do
basic research and we manufacture machines.
We are problem solvers and we are technical advisors

We Are Your Partners.

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